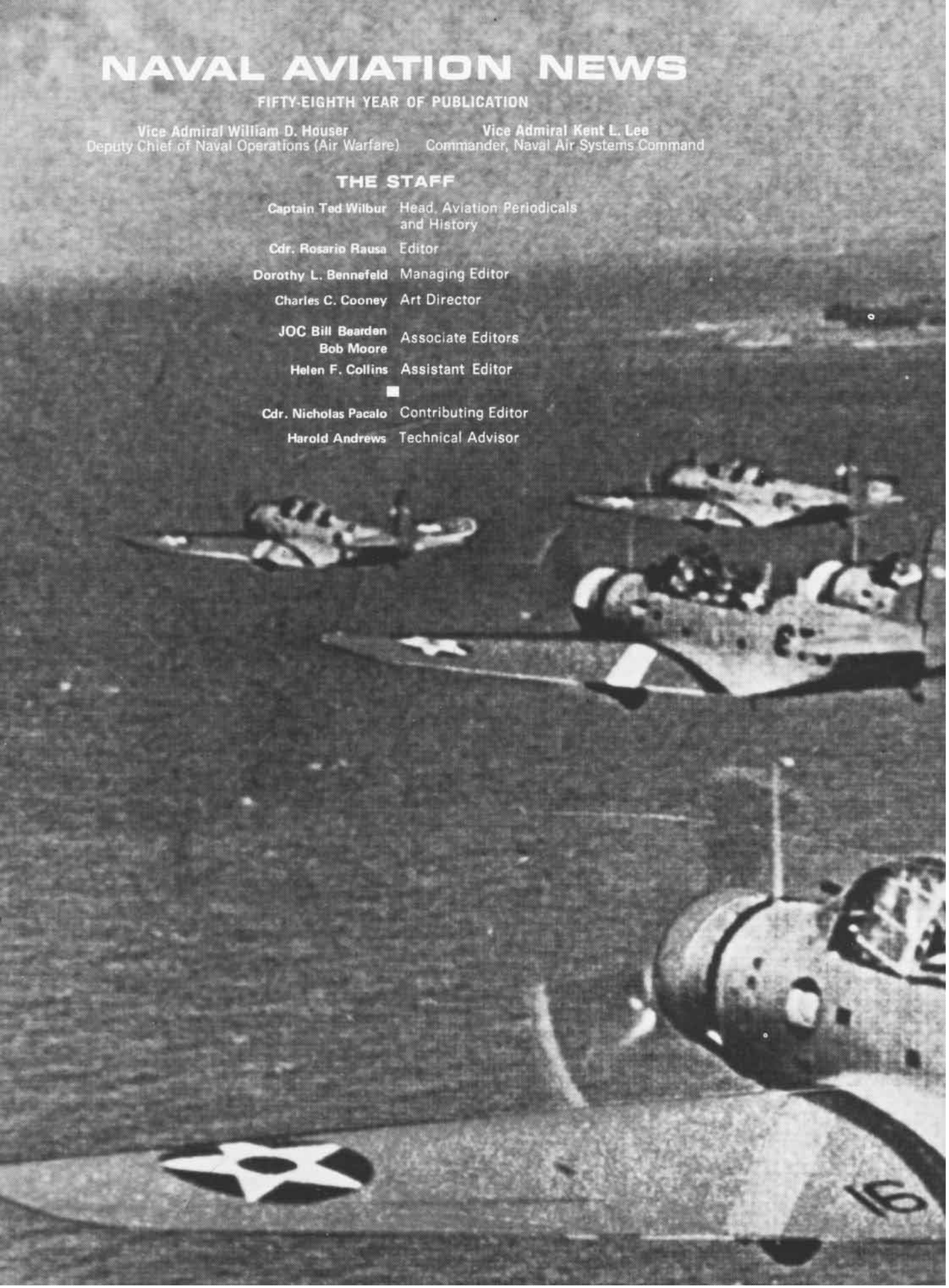
NAVAL AVIATION NEWS

JANUARY 1976

NAVAL AVIATION NEWS

FIFTY-EIGHTH YEAR OF PUBLICATION



COVERS

Front, Ely's historic landing on USS Pennsylvania illustrated by R.G. Smith, Douglas Aircraft Company (see story, page 8). Close-up view of Ely is on back cover. These TBDs were filmed in the late 1930s. Photograph is from the collection of Richard W. Smith.

editor's corner

Just about every magazine in the business is hailing the bicentennial year with stories from the American past. *Naval Aviation News* has another reason for looking back in 1976. It was 65 years ago, on May 8, 1911, that an A-1 *Triad* was purchased. This transaction marked the official birthdate of Naval Aviation. So, with this and the next 11 issues, *NANews* will salute great moments from the Aviation Navy's past.

Five months before the purchase of the *Triad*, another transaction took place. The scene was San Francisco Bay. A young flyer named Eugene Ely made the first landing on a ship using arresting gear which shares the fundamental design of that on carriers today. A dramatization of this event begins on page eight.

NANews was most fortunate in having R. G. Smith, the eminent artist from Douglas Aircraft Company, draw the cover. Ely's trap was chronicled by numerous photographers on *Pennsylvania* and other boats nearby. But Smith imagined himself aloft in a helicopter watching the historic first, providing an exclusive view of the event.

Each month we will feature a chronological listing of salient events which occurred through the years. "The Log" for January appears on pages 16 and 17.

In February we hope to share with you a few moments spent with Senator John Glenn, the former Marine flyer and astronaut who became the first American to orbit the earth. Fired into space by an *Atlas* rocket, Glenn circled the earth three times in *Friendship 7* in February 1962.

Clarke Van Vleet, Naval Aviation Historian, will tell the story of Vera Cruz where flying units were called to action for the first time in April 1914.

There will be an account of the first arresting gear tests conducted at Hampton Roads, Va. The man in charge was A. M. Pride, who rose from the enlisted ranks to become a vice admiral. The Admiral is a fascinating, living source book. A modest man of great achievement, he is going strong in his seventies. During a recent interview he entertained us with tales from the days of the first aircraft carriers.

It was Pride, who, as a lieutenant, taxied an Aeromarine into arresting wires during the tests in August 1921. The gear was being evaluated for installation on USS *Langley* (CV-1).

At one point in the interview, VAdm. Pride excused himself and returned momentarily with stacks of scrapbooks and an intriguing remnant from his early flying days. It was the original crash helmet he wore during those tests. Of simple design, it looked like a thick skull cap with ear flaps. It had lost some of its symmetry, but it was in remarkably good condition. It had the feel of quality leather and seemed sturdy enough to withstand some mighty blows to the cranium.

The Admiral had numerous pictures including some of the arresting gear system which he designed. He considers this his major achievement although he later became a central figure in WW II and after.

One picture shows an Aeromarine in the groove, approaching *Langley*. The photo was taken from about 1,000 feet overhead. "That's Chevalier making the first carrier landing," he explained. (Ely's trap was made aboard a specially rigged cruiser.) "The crewman with me had a camera. We'd gone up to toss smoke lights out. We were very concerned about turbulence and wanted to check out the wind effect before Chevalier made his try."

VAdm. Pride told us about pigeons, how he carried them in his flying boat for emergency purposes. He had an excellent photograph of the pigeon loft on *Langley*. It looked like a country cottage sitting incongruously on a warship. He recalled the day all the pigeons flew away from *Langley*, unexpectedly, never to return. We hope to publish some of the Admiral's rare photographs.

Lest we step too deep into the past, we are most pleased to have on board a new associate editor who has been charged with keeping you up to date on the present and the future. JOC Bill Bearden has checked aboard from Athens and scored a record of sorts, himself. This is his eighth assignment *in eight years*. There was some difficulty in getting the chief to unpack his bags upon arrival.

Chief Bearden has written all photojournalists in the Navy to solicit their efforts in keeping the information flow to the magazine on track.

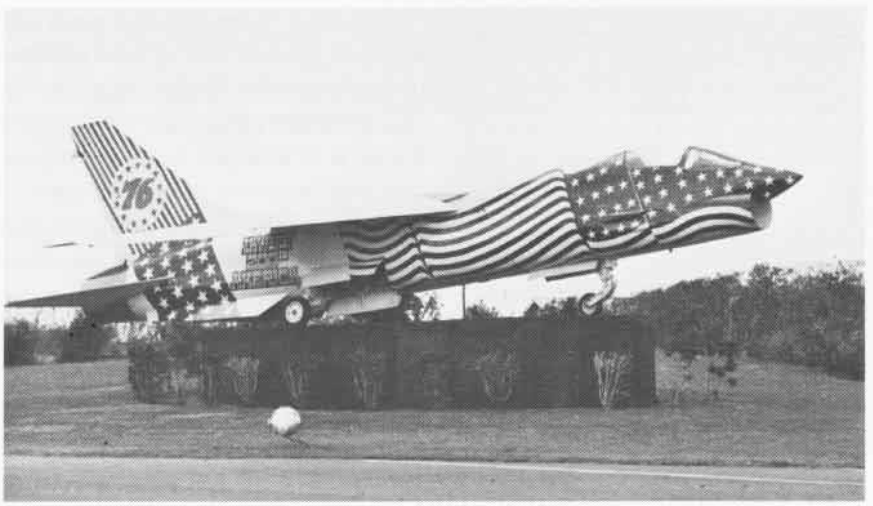
It's sound practice to look into the American and Naval Aviation heritage. We can learn from and enjoy the past. At the same time we hope to tell you what is happening now and what lies ahead on the Naval Aviation horizon.

Naval Aviation NEWS did you know?

Bicentennial Crusader

The new paint job for the F-8H *Crusader,* located at the main gate of NAS Barbers Point, was accomplished to commemorate Fleet Composite Squadron One's 50th anniversary and the Navy's 200th birthday.

AMS2s John Hart and Nick Magparjo, and AMS3s William Benjamin, Catarino Trevino and Michael Fredrick did most of the work. They are all members of the intermediate maintenance department. Acrylic automobile paint was used. The bicentennial design on the aircraft is the work of AMHC Gary A. Davidson.



NRL Patents

Four Naval Research Laboratory scientists and a former NRL employee were recently awarded patents.

Dean D. Howard and David C. Cross received a patent for the development of a digital radar target imaging monopulse radar system which optically displays radar information on a three-dimensional method for visual identification of targets.

By visually displaying the target in 3-D, a radar operator can quickly discern from its shape whether a particular target is a bomber, fighter, etc., and if it is an enemy or friendly target.

The system receives data from a high-range resolution monopulse radar system having wideband monopulse tracking capability and processes it in a display processor so that its three outputs are representative of the three-coordinate data information. The data is then displayed in a three-coordinate display apparatus.

Garold K. Jensen and James E. McGeogh were granted their patent for development of a storage type, phase coherent, pulse-doppler radar system wherein return signals containing doppler information from a plurality of ranges

can be stored and then analyzed to determine the velocity and acceleration of targets.

The resulting velocity, acceleration, range and time data, obtained through the use of the system, can be stored in a plurality of two-dimensional capacitor matrices. Each of the four parameters are being stored as a function of each of the other three parameters. Neon lamps associated with each of the storage capacitors and arranged in rectangular arrays, indicate the information retained in the matrices.

The former research laboratory scientist, Michael Schmookler, was awarded a patent for the invention of a passive range computer for use by interceptor pilots.

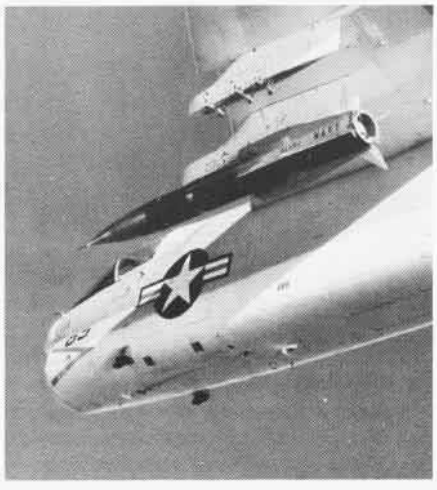
Schmookler devised a method and apparatus whereby the pilot can compute the range of an object when the ranging, but not the detecting and tracking capability, of the aircraft's radar is destroyed by countermeasures.

The computer invention determines target range from the heading of the interceptor, the rate of turning while on a line of sight heading, and the angle between the line of sight and lead collision courses.

Mr. Schmookler was employed by NRL when he developed the device.

LVRJ Tested

Navy's low volume ramjet (LVRJ), a high-performance propulsion system designed for advanced missile systems of the future, made its second flight at the Pacific Missile Test Center at Point Mugu, Calif., in November.



Launched from an A-7, the 15-foot-long, 15-inch-diameter vehicle performed a series of programmed turns to demonstrate maneuverability as it flew more than 50 miles downrange.

The current test program calls for flights at altitudes ranging from 2,000 to 35,000 feet and for maneuvers which simulate air-to-surface, surface-to-air, long-range-standoff and terrain-following missions.

The successful flight was the second in a six-flight demonstration program which is expected to extend through 1976.

MQM-74C

The Northrop Corporation recently completed, on schedule, the 400th MQM-74C target aircraft for the Navy.

The MQM-74C provides realistic training for gunnery and missile crews by

simulating the attack and evasive maneuvers employed by modern planes. It can fly at speeds of 576 miles per hour and reach an altitude of 40,000 feet.

An international version, *Chukar,* is used by a number of allied nations.

Antenna Test Range

A new activity, the X-and-L Band Radar Antenna Range, is expected to be fully operational at NARF Norfolk this month. The new range will be used to test the microwave functions of the radar antenna which is a part of the AN/AWG-9 weapons control system of the F-14 *Tomcat.*

Hughes Aircraft Company built the system and is establishing a depot repair activity for it. The radar antenna range is the last of six test stations for the AWG-9 antenna.

The antenna, a highly complex, sophisticated unit, is very accurate, powerful and sensitive. As part of the AWG-9 system, it is able to detect a target the size of an A-4 at a distance in excess of 125 miles. It can track 24 targets and attack six individual targets – while continuing to scan airspace.

The range consists of a transmitting tower and a three-story building with a wrap-around picture window. The site was carefully selected so as to cause the least amount of radio interference to station air traffic and at the same time to avoid any signal interference from outside sources. It was also free of vehicular traffic and no buildings were nearby. The area between the tower and the "receive" building was hand-raked to remove any objects larger than golf balls. Diffraction fences were placed in the field between the tower and the receive building to eliminate ground reflections. Sheets of radio frequency absorber were placed around the receive window to shield the antenna from building reflections. An accurate antenna range is provided and testing of the AWG-9 antenna to its limits results.

The antenna is tested by transmitting a microwave signal from the tower to the AWG-9 antenna which is mounted on a turntable in the receive window of the building. The turntable is rotated as the received signal versus the antenna position is recorded at the control console. Forty-eight patterns at various frequencies and antenna orientations are recorded to enable a detailed analysis of the antenna's condition. The sensitivity is checked by comparing the known sensitivity of a standard antenna with the sensitivity of the AWG-9 antenna.

grampaw pettibone

Abort Disaster

A Naval Aviator and his bombadier/navigator (BN) were scheduled for a two-plane training flight in an A-6E *Intruder*. The pilot, who was the flight leader, had over 600 hours in the A-6 and over 1,200 total hours.

Following a standard brief, the crew obtained a weather brief via closed-circuit T.V. There was no mention of thundershowers for the scheduled takeoff. The crew arrived at maintenance control on time but, due to aircraft reassignment and some minor maintenance problems with the second aircraft, the flight taxied approximately 40 minutes late. During this time, a thunderstorm passed over the field, causing heavy rain and left water standing on the airfield surfaces.

After the flight received an IFR clearance and arrived at the takeoff area, another thunderstorm passed over the field, again causing heavy rain, leaving more water on the runway and decreasing local visibility. Because of these conditions, the pilot advised clearance delivery that he desired a one-minute departure separation betweeen the two aircraft. He then delayed his request for takeoff clearance for approximately ten minutes in anticipation of reduced precipitation and increased visibility. When the visibility increased to an estimated two miles, the pilot requested clearance. The *Intruder* initiated takeoff from a position approximately 400 feet from the approach end of the runway.

The takeoff temperature was 77 degrees F and tower winds were 130 degrees at eight knots. As the roll commenced, departure control inquired, "Are you up?" and "Are you airborne yet?" The pilot answered both these transmissions as he was accelerating down the runway. The reason for the inquiries was that the passing thunderstorms had caused numerous power failures in the preceding three minutes and departure control was unsure of the location of the lead aircraft. Departure control then transmitted, "Be advised, we've been losing our radar here intermittently because of power fluctuation." At this point, the A-6 had accelerated to an airspeed of approximately 105 kias and the pilot made the decision to abort his takeoff.

The throttles were pulled to idle. The aircraft was aligned on the center line and as the pilot initiated light braking, he saw the 4,000-foot marker along the runway edge. As braking pressure was increased, the left tire suddenly blew out and the aircraft commenced a left drift which the pilot attempted to correct with nose-wheel steering and moderate differential braking. The hook was lowered. As the aircraft continued to drift, it failed to respond to attempted directional control.

The A-6 travelled approximately 1,500 feet after the tire blew out before it engaged the abort gear at an estimated speed of 50 kias, 40 feet left of center line in a 30-degree left drift. After approximately 300 feet of runout, the left landing gear departed the runway, paralleled the runway for nearly 100 feet through the muddy terrain and contacted a cement runway light foundation approximately one foot below the surface.

This contact collapsed the left gear rearward and swung the aircraft further left causing it to completely leave the runway and travel 200 feet through the muddy grass surface on its left wingtip, nose gear and right gear before the abort gear halted its progress.

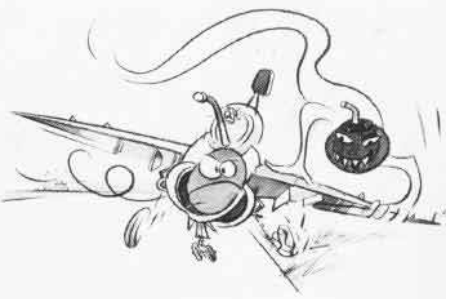
The pilot secured the engines and the crew exited the aircraft by manually unlatching the canopy. There was no fire. The crash crew and other airfield units responded immediately to secure the aircraft, which sustained substantial damage.

Grampaw Pettibone says:

Great balls of fire! When things seemed to be goin' good, this gent decided to screw them up! Why abort at that speed with all that water just because the controllers were losing their radar?

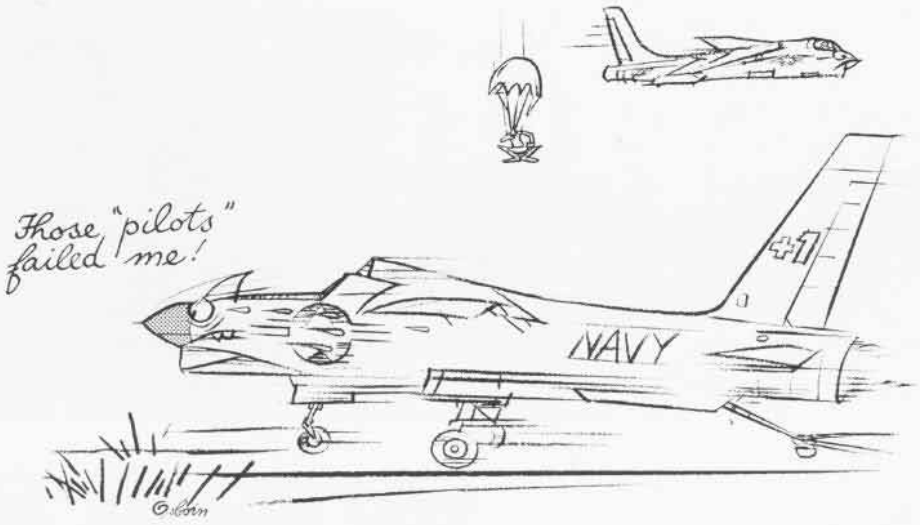
"I'll tell you something else. That controller had a "hand" in this. His cries of "wolf" during the takeoff roll were completely uncalled for! He gave both of the gents in the aircraft an uneasy feeling that something just wasn't right.

However, in order not to be misquoted — the pilot did it ,but, controller, you certainly "helped."



ILLUSTRATED BY Osborn

F-8 Superdrone



The pilot was scheduled for his second familiarization flight (Fam 2) in the F-8H *Crusader*. A lieutenant commander was assigned as chase pilot for the afternoon hop and the brief was conducted accordingly.

Some thunderstorms were observed in the local area. The decision was made that the Fam 2 could be conducted within the necessary parameters (VFR conditions). The weather forecast for return was 4,000 broken, 25,000 unbroken, seven miles visibility, winds at 140 degrees, ten knots and thunderstorms in the vicinity.

The pilot launched but, because of possibly deteriorating weather conditions, the squadron duty officer (SDO) was directed by higher authority to issue a weather recall to the Fam 2. Chase assured the SDO that the flight would have no difficulty returning VFR and requested permission to remain in the touch-and-go pattern, weather permitting. This request was granted providing winds were favorable for the Fam 2 touch and go's.

Chase decided the pilot could make some practice approaches to burn down to landing weight. He instructed the tower to inform him if the crosswind increased. Tower rogered and advised that the thunderstorm appeared stationary.

After about ten minutes, touch and go's began. Runway 17 was in use and the wind varied from 220 degrees at four knots to 270 at 12. After several landings the wind was reported 270 at 16. Because of the crosswind limitation on the F-8H, chase informed the pilot of a possible field arrestment.

He then directed the pilot to make a low approach on his next pass to allow more time to evaluate the gusty wind conditions. The wind was again reported 270 degrees at 16 knots. The low approach was completed and the tower now reported winds 270 at ten. Realizing that winds were again within aircraft limits, chase directed the pilot to make a full stop on his next pass. The pilot commenced the approach with winds 270 at 16 and chase directed a touch and go vice a full stop. Following the completion of this touch and go, the chase pilot directed the next pass to be an arrested landing.

The duty runway had two approach end arresting gears and two long field arresting cables located at 6,000 and 7,000 feet from the approach end of the runway. The pilot commenced his approach and touched down approximately 500 feet short of the number one arresting gear and rolled into the gear. The *Crusader* hook skipped both short field wires and the pilot executed a go-around.

During the next approach, chase was flying on the starboard side at the four o'clock position approximately 100 feet aft. Because a short field arrestment was not briefed, chase found it necessary to refresh the pilot's memory on this procedure while airborne. With wind 270 at 14, the aircraft touched down approximately 500 feet from the first arresting gear. According to chase, the aircraft attitude appeared normal and approach procedures were satisfactory. The pilot stated that he left approach power on the aircraft during his ground roll. Once again the F-8 boltered both wires.

Chase quickly directed the pilot to take it around. The F-8 became airborne well past midfield. The *Crusader* left the runway in a nose-high condition, fishtailing. Some witnesses said the aircraft was over-rotated. Others described the aircraft as on the edge of uncontrolled flight. The pilot said that he felt the aircraft start to settle and, 17 seconds after the bolter call, he transmitted: "I got something, this thing's not flying." In the same moment the pilot selected afterburner and an *estimated one second later he ejected.*

The aircraft rose 20 feet. The pilot ejected at about 15 feet. After ejection, the aircraft continued 600 feet, touched down and engaged the number four arresting gear, 1,000 feet from the end of the runway. The aircraft touched down approximately 30 feet from the number four arresting gear cable and came to rest near the left side of the runway. The pilot's seat functioned normally. The pilot landed in a lake along the port side of the runway and was rescued uninjured. The aircraft sustained limited damage.

Grampaw Pettibone says:

Sufferin' catfish! This one takes the cake! I frankly must admit that this aircraft did a heck of a lot better without the pilot.

It was pretty interestin' to note that field arrested landings were not briefed because "They weren't in the book." In other words, "Do only the minimum required." Baloney!

What was "in the book" was that an "LSO should be on station during attempted arrestment." However, this was very quickly *rationalized* away. I don't recall seeing or hearing about a Natops change submission or a waiver request on the subject of "LSO during field arrested landings." Seems to me that there is something called *complacency* in this squadron.

The First Trap

By Commander Rosario Rausa

The flyer looked at the high grey clouds and felt the cool wind against his face. The rain had stopped and time clicked toward eleven o'clock. The biplane was ready. So was he. The flight had been delayed too long already. He thought of Captain Pond and the crew on *Pennsylvania*, the sacrifices they had made. He was glad that the moment of truth was fast approaching.

He watched the men in army uniforms, greatcoats and coveralls huddling near the flying machine. They seemed as restive now as they had been earlier in the chilly California morning. They had paced about anxiously then, waiting out the weather. Wisps of moisture had blossomed from their mouths and disappeared quickly in the cold. They had been dismayed when the report came in. They feared another delay.

"The wind is bad, Gene," one of them had said. "The ship is riding on a flood tide. She'll be pointing toward the Golden Gate. That means you'll have the wind at your back or off your right shoulder as you approach the ship."

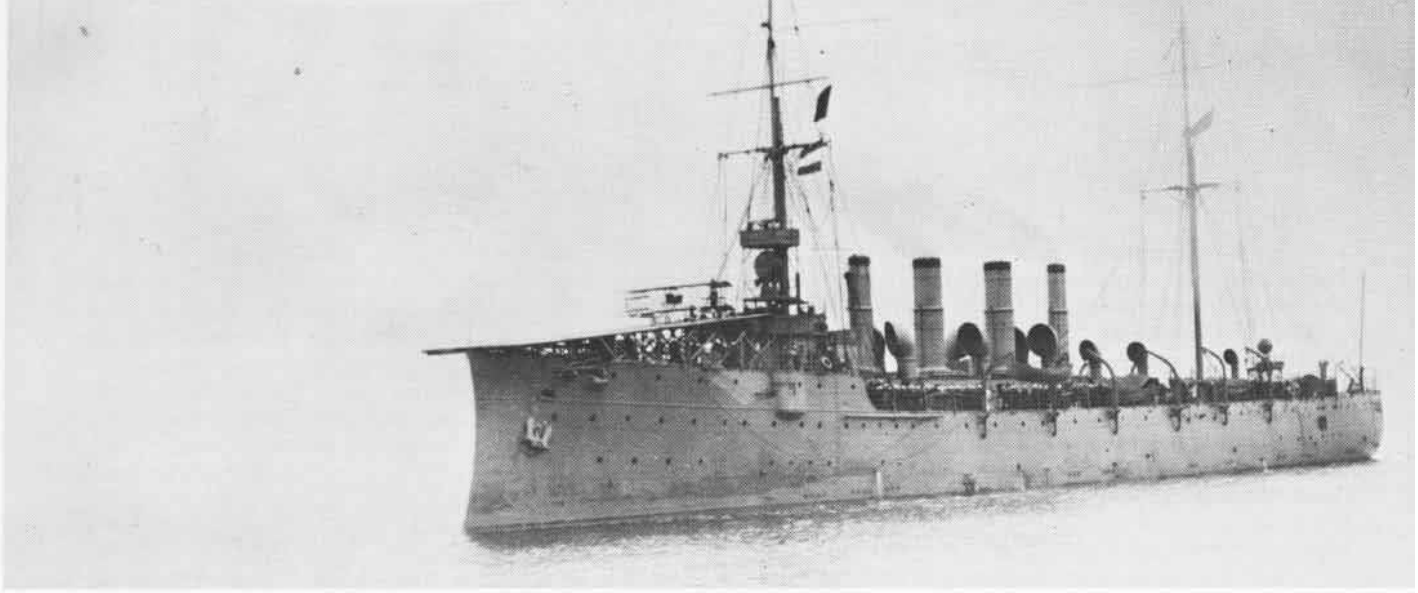
Ely recalled the discussion days before with Charles "Frog" Pond, skipper of the armored cruiser. "I want to help in any way I can," said Pond, "but, if we're underway, inside the bay, we won't have enough maneuvering room. You could try to make the landing with the ship at anchor," he went on. "Otherwise, we'll have to go out into the Pacific."

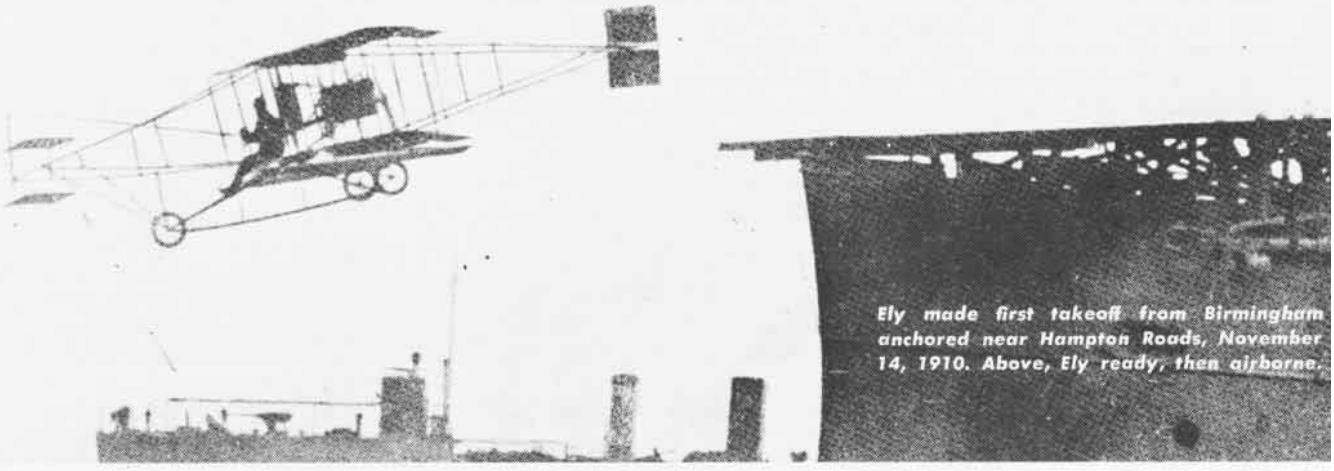
The flyer carefully considered the options. He respected the veteran naval officer's judgment. Finally he said, "I believe we can succeed with the ship at anchor, inside San Francisco Bay."

Ely was glad the captain and his crew were cooperating. Building the wooden platform over the aft turret and the quarterdeck to the stern obviously disrupted the ship's routine. The C.O. was allegedly miffed because his cabin had become cloaked in shadow.

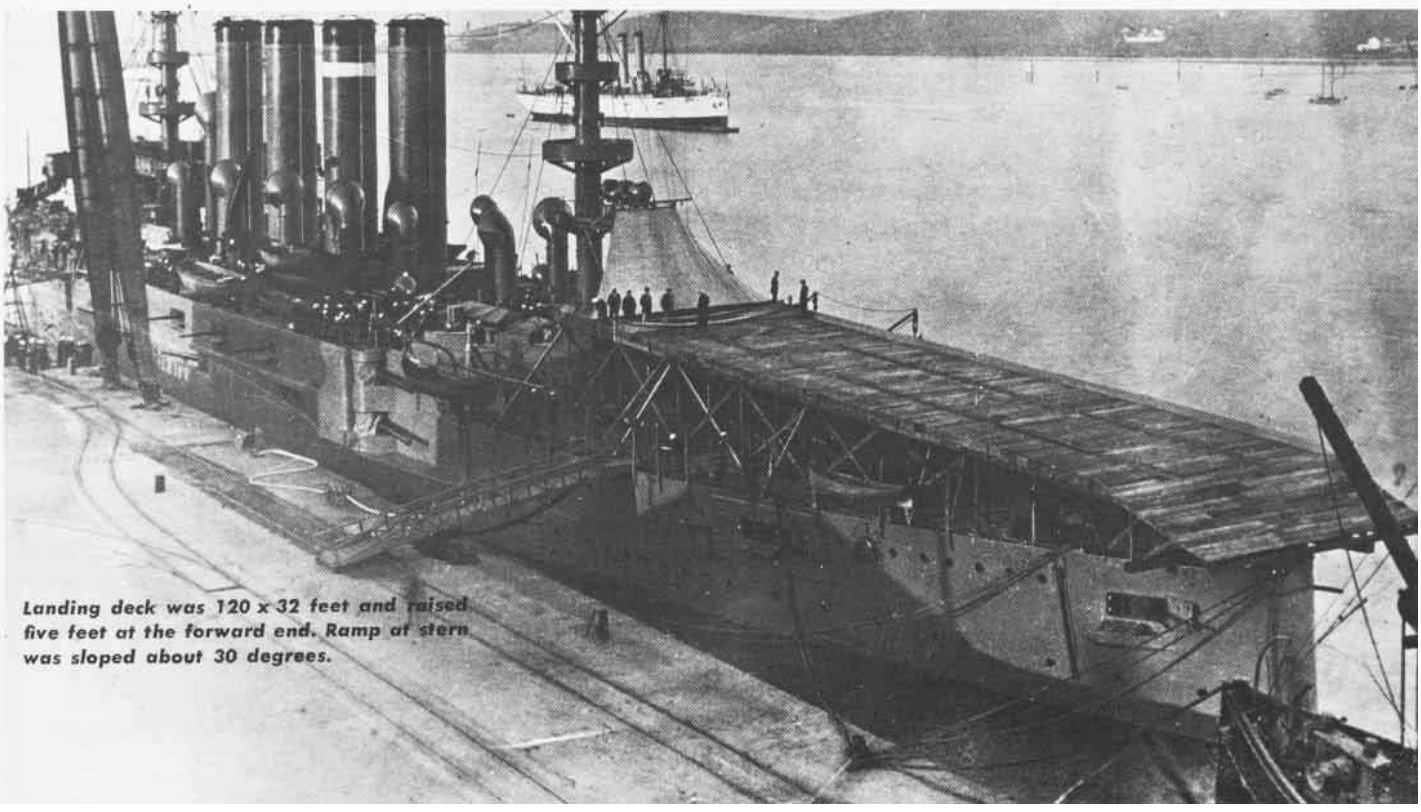
Yet it was Pond himself and Ely who dug into their own wallets to pay for the sandbags, the manila lines, and the guard rails, all of which would serve as arresting gear.

Now it was time to learn if all the practice and all the preparation would pay off. Would he be able to land his





Ely made first takeoff from Birmingham anchored near Hampton Roads, November 14, 1910. Above, Ely ready, then airborne.



Landing deck was 120 x 32 feet and raised five feet at the forward end. Ramp at stern was sloped about 30 degrees.

1,000-pound aircraft on the platform and prove that airplanes and ships were, indeed, compatible?

Gene Ely knew what Mabel was thinking as she waited aboard the ship with Pond and the overflowing entourage of Navy men, reporters and VIPs. His wife had seen him fly many times. She was there, on a destroyer, three months earlier at Hampton Roads when he took off from *Birmingham* and dipped frighteningly toward the water. She watched as he literally plowed through the wavetops and somehow kept the aircraft under control, climbed above the surface and flew 12 miles to a safe landing on a sand spit. Although the propeller had been cracked in the process, the event signaled the first launch of an airplane from a ship.

There had been no little criticism surrounding the test. "Too Hazardous," blared one newspaper headline. "Airplanes Were Not Built for Operation at Sea," cried another. "Foolish — Endangering a Man's Life," declared still another.

The mating of airplanes with ships was viewed with skepticism by Navy factions as well. Despite the resistance and the inflammatory allusions to him as a daredevil, the pilot was unruffled. Those close to him knew that he was a calculating man who loved to fly but who had a convincing appreciation for planning and practice. They remembered his answer to a newsman's question days before. "I never fly," he had said, "except when I know it to be safe."

Now, although the predicted wind would push him at a critical moment in the approach, he was quite confident he could effect the landing. He had practiced on the grass field by landing the pusher with the wind blowing from various directions. He had chalk-marked the outline of the simulated deck and trained himself to make precision touchdowns.

Ely strode to the Curtiss pusher. The mechs and some of the infantrymen from the Army detachment stationed at the Tanforan field circled around him. He wrestled the stained leather coat over his business suit. He wrapped the bicycle tube around his shoulders and torso, forming an X across his chest. He flexed his arms. "Much better," he said. "That survival vest I wore on *Birmingham* was too cumbersome."

He pulled on the heavily padded football helmet with the thick flaps which generously covered his ears. He tied the goggles loosely about his neck and slipped his fingers into the gloves.

He sat on the wooden seat and the mechs circled a rope around him and the back frame of the seat. They secured the ends in sturdy knots. The flyer twisted momentarily and nodded his head. "The harness is tight enough," he said. He then grasped the steering wheel. It felt sturdy in his hands.

The people moved away. Brief and serious cries of encouragement flew toward him. He fixed the goggles over his eyes and waved. Then, quickly, the engine grumbled into life. A moment later the flyer chugged away and guided the biplane into takeoff position. Those at the edge of the field grew silent.

The pusher's motor throbbed loudly. Jolting and bouncing along, the aircraft gathered speed. It raced ahead and leapt into the sky. It was 1045 on January 18, 1911. Eugene Ely, a 24-year-old ex-farm boy from Iowa, was flying into Naval Aviation history.

He rose slowly. Three hundred feet. Four hundred. Five hundred. The fierce cold engulfed him and he felt a stiffening breeze as he gained altitude. He moved his arms and legs, trying to keep them nimble. He banked toward the San Bruno hills and leveled the pusher at 1,200 feet. His airspeed increased to 60 miles per hour. At Hunters Point the land mass passed beneath him and he turned north toward the waiting ship.

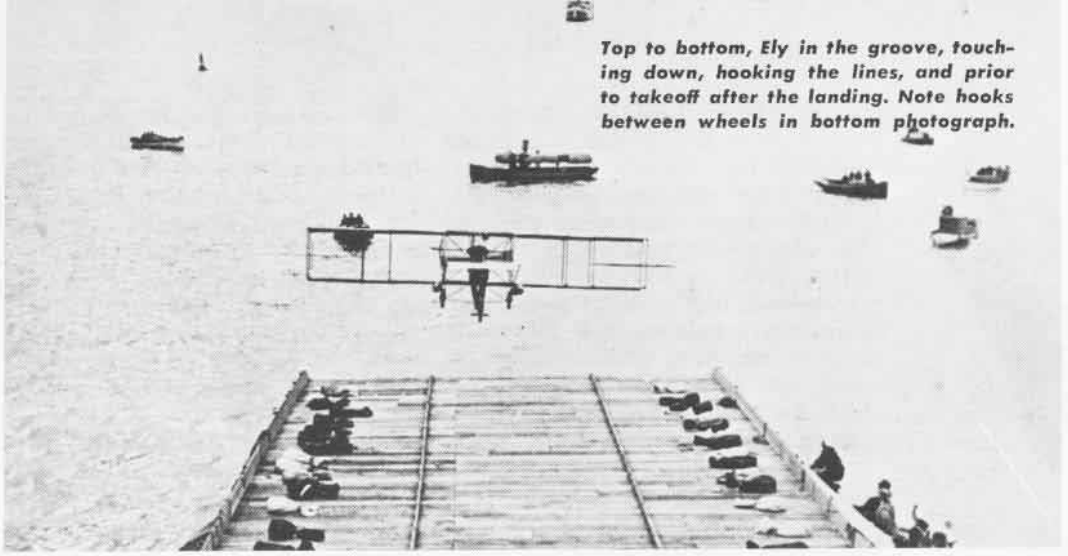
But it was hazy. For several minutes he could barely see ahead. On *Pennsylvania* every vantage point was packed with onlookers. Sailors in blues were perched on the ship's masts. Along the Embarcadero and the shoreline which faced Goat Island (now called Yerba Buena Island), crowds had gathered. People stood on the docks which jutted into the bay. An armada of small boats converged toward the cruiser and mingled with those dispatched by Capt. Pond as a potential rescue force.

About two miles away, Ely squinted through his goggles and was able to make out the profiles of *Pennsylvania* and a scattering of other large ships. He began a descent and the brisk wind sang through the wires of the biplane. *Pennsylvania* loomed before him and Ely quickly saw that the stern was facing the wind, the bow aimed westward toward the Golden Gate which opened to the Pacific. He swung downward through 400 feet, then 100. He leveled off. The pusher slowed to 40 miles per hour and from deep astern, Ely turned toward the ship.

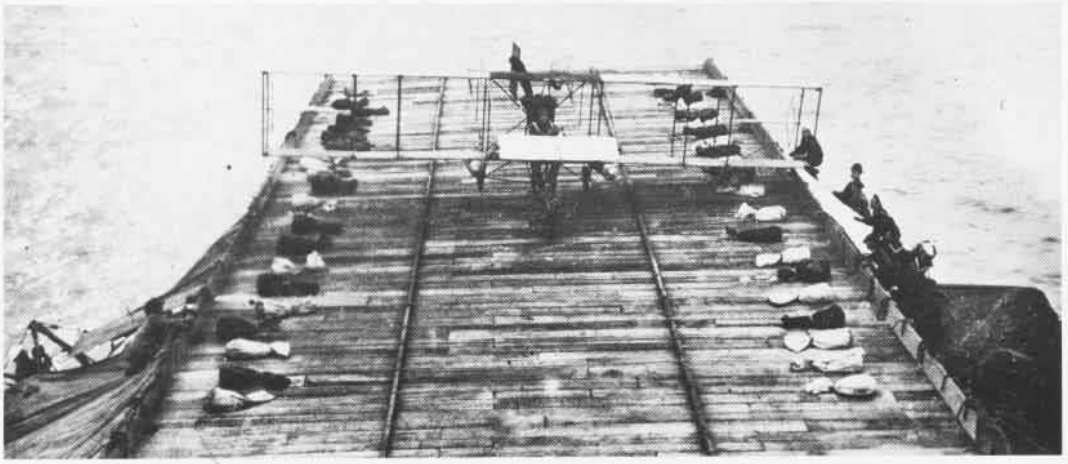
As he flew by at topmast height, he was startled at the number of people wedged throughout the armored cruiser. He could sense the mass turning of heads, following him as he passed. The platform was clear, the score of lines appeared taut and in place, and all looked in order. The bow safely behind him, he turned back toward the ship. He glanced to his right and saw the shorebound audience.

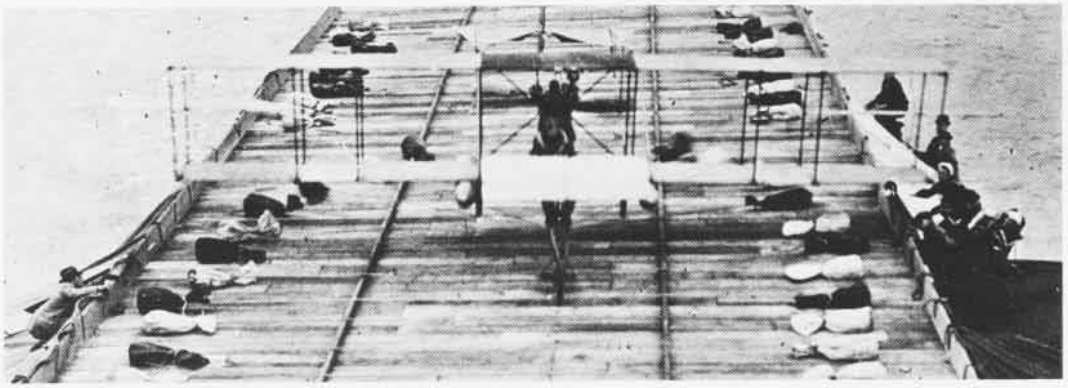
He flew by the ship. Then, 100 yards astern, banked into his approach. On *Pennsylvania* the voice of the officer of the deck boomed, "Stand by." It grew so quiet that the only sound was that of Ely's motor whirring in the distance.

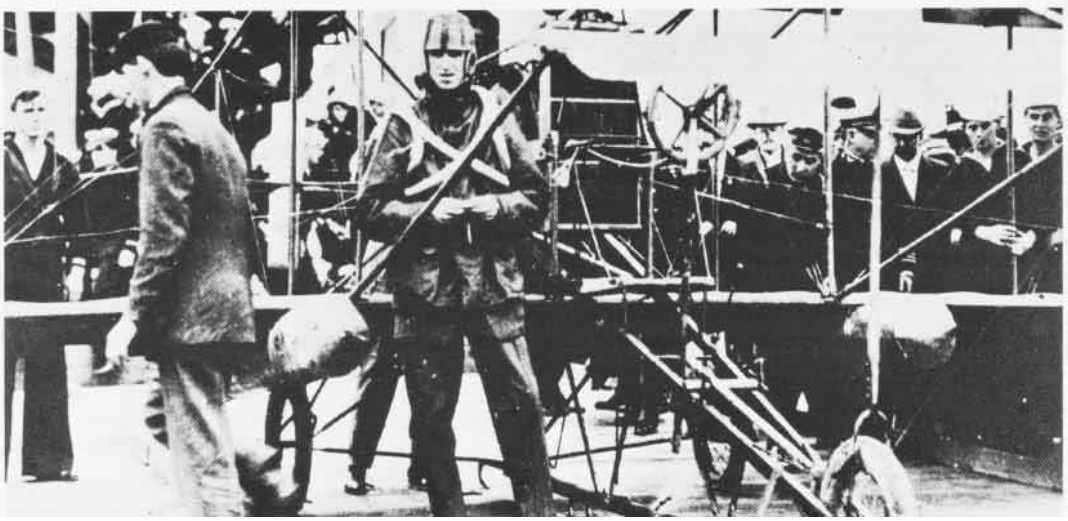
As he was completing his inbound turn, Ely alertly calculated that the wind would push him diagonally from right to left. He decided to level his wings and line up with the windward side of *Pennsylvania*. He eased down slowly. The ship loomed close ahead



Top to bottom, Ely in the groove, touching down, hooking the lines, and prior to takeoff after the landing. Note hooks between wheels in bottom photograph.





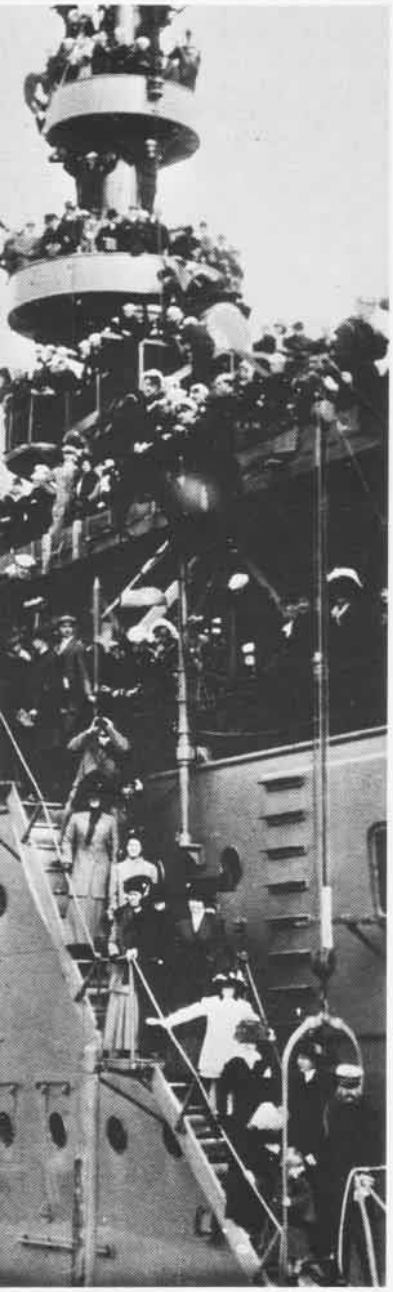


of him. He realized his adjustment was perfect. He arrived at a point about 50 feet from the sloping overhang of the deck, perfectly aligned with the shipborne runway. He cut his engine and heard himself say, "This is it."

Suddenly, unexpectedly, he felt the biplane balloon upward. It was as if a giant hand had swept by underneath and pushed him up and away from the ship. A wave of apprehension swept through the crowd in a collective gasp.

Ely eased his machine downward. He saw half of the arresting lines go by. But the aircraft settled back into a descent. Then, almost gently, the tires struck the deck. The hooks between the wheels snagged one line, then another, and another, until all of the remaining lines were gathered up, pulling the sandbags tied to their ends.

Completely stopped, Ely looked behind, then ahead. He had used 30 feet to effect the landing; another 50 feet lay ahead. The time was 1059.



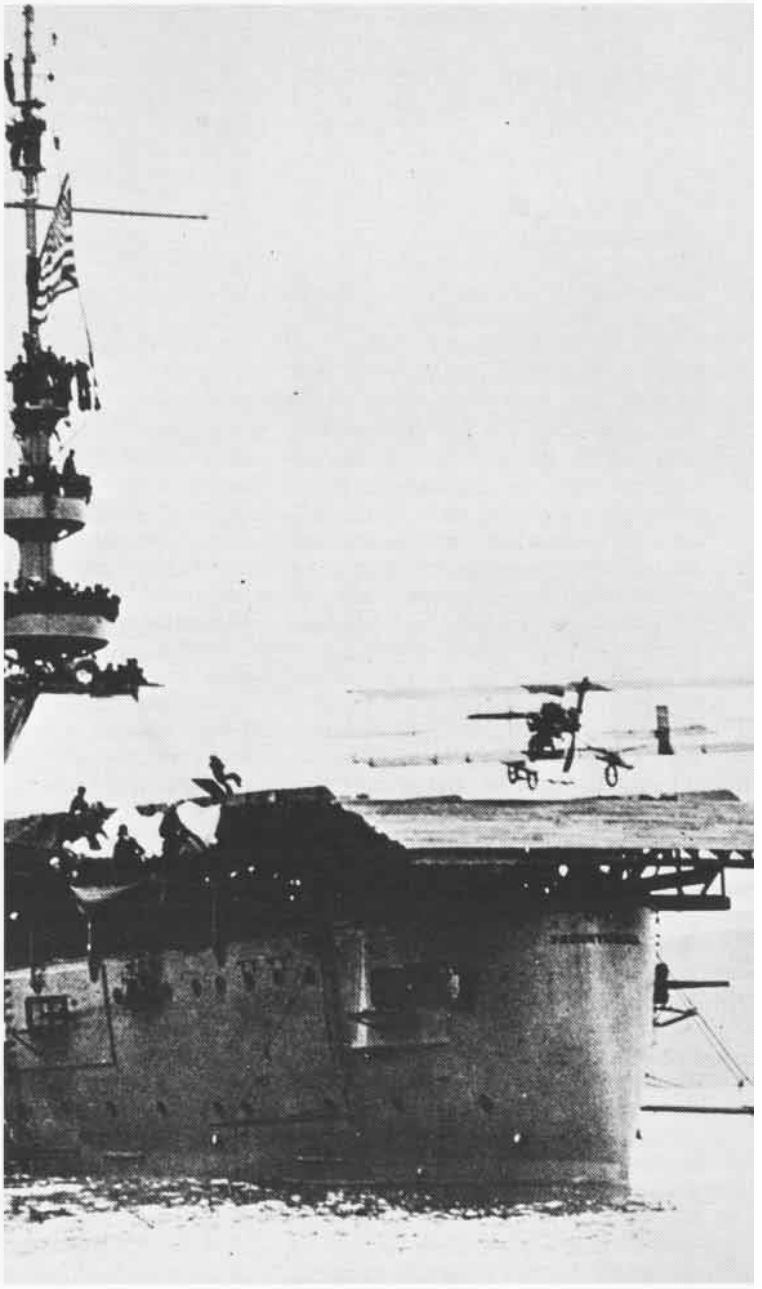
If the greatest applause is silence, Eugene Ely had achieved it. The curious quiet lingered. He had succeeded. He had safely landed an airplane on the deck of a ship.

Finally, the impact of the achievement absorbed, wild cheering broke out. The exuberant shouting cascaded from *Pennsylvania* over the surrounding boats and onto the shore. Ships' whistles shrieked. Sirens in the city took up the call. It was a moment of majesty and the onlookers felt a surge of joy at having been part of it.

The ropes were loosened from around him and the flyer, perhaps the calmest person there, rose casually from the seat. Mabel Ely rushed into his arms. "Oh boy," she cried, "I knew you could do it!" Capt. Pond vigorously shook Ely's hand and, as photographers captured the scene, he said, "This is the most important landing since the dove flew back to the *Ark!*"

Capt. Pond then guided the group to the quarterdeck. Before entering his cabin, the captain turned to his

Far left, throng aboard Pennsylvania. Mabel and Gene Ely pose with Capt. Pond shortly after landing, center. Man in the middle is unidentified. Below, a view of the pusher over the ramp, as seen from a nearby boat. Note the canvas barricade at end of the platform.



officer on the deck with an order. "Mr. Luckey, let me know when the plane is respotted and ready for takeoff." The reference to "respot" in this command was destined to become a byword in carrier aviation.

Lunch and champagne toasts followed but Eugene Ely, mindful of the return trip, had ginger ale. A few minutes before noon, the officer of the deck reported that the Curtiss pusher was spun around, refueled and ready for takeoff.

As Ely was strapping in again, thoughts of the takeoff from *Birmingham* swept quickly through his mind. He recalled that frightening dip toward the water. But just as quickly, confidence soared through him. Doubt was chased away.

He revved the pusher engine and rolled across the wood surface — and climbed away. He flew a wide arcing turn to the south and at 2,000 feet was oblivious to the cold as he headed back to Tanforan, his starting point, ten miles away. Less than 15 minutes later he was on the ground. He was greeted with gusto, hoisted onto the shoulders of the Army men and immediately proclaimed an honored member of their mess.

Before he took to the air, Eugene Ely was an aficionado of the automobile. Motors and cars fascinated him and, by the time he was a teenager at the turn of the century, he was considered a master mechanic. Born on a farm near Williamsburg, Iowa, he was once described as the "best driver in the state."

He moved to California, worked on and raced cars. He became friends with Barney Oldfield and Eddie Rickenbacker, popular names in the driving field. At one time Ely even held a speed record at a track in San Jose.

Gene might have remained happily on the ground had it not been for his wife. He was in Oregon when Mabel Ely, in California, advised her husband to look at a Curtiss aircraft on display in Portland. She had seen the plane when it was in San Francisco and thought Gene would be interested.

Ely took his wife's advice, saw the flying machine and was instantly fired up with the ambition to master it. The aircraft itself was for display purposes only, but Ely bought it for $5,000. He put it in flying shape, taught himself to operate it and was soon barnstorming in the northwest. He and Mabel went on the circuit and were in great demand. In fact, Ely could garner $1,000 per performance, top money then.

He migrated eastward and in Minneapolis ran into Glenn Curtiss and his entourage of flyers. Curtiss met Ely, saw the plane and was enraged. It was not meant to be flown and Curtiss threatened court action.

Curtiss developed second thoughts, fortunately, and instead of battling Ely, signed him on. They became close friends.

One of Ely's stunts was to "bomb" a chalk-marked outline of a ship, with bags of flour. This apparently led to his thoughts about operating a plane from a ship. Late in 1910, when Ely was touring in Baltimore, Md., a fateful meeting took place between the young flyer and Navy Captain Washington Irving Chambers.

Chambers was the man to whom aviation matters in the Navy Department were referred. He had not been an advocate of the flying machine when it first appeared years earlier. Further, he had only begun his cherished battleship command when, prematurely, he was summoned to Washington for staff duty. He became a vital supporter of airplanes, however. Convinced of the role they could play in the Navy of the future, he took up the cause.

He had gone to Baltimore to see the Curtiss air show and one afternoon, at Ely's hotel, met the Iowan. The subject of flying a plane from a ship came up. Chambers was a bit stunned when Ely said, "I've wanted to do that for some time." Since Ely's contract with Curtiss permitted him to perform on an individual basis, he was free to answer Chambers' need for a pilot. This important merging of minds between a naval officer and a civilian was destined to accelerate the growth of aviation in America's sea-going forces.

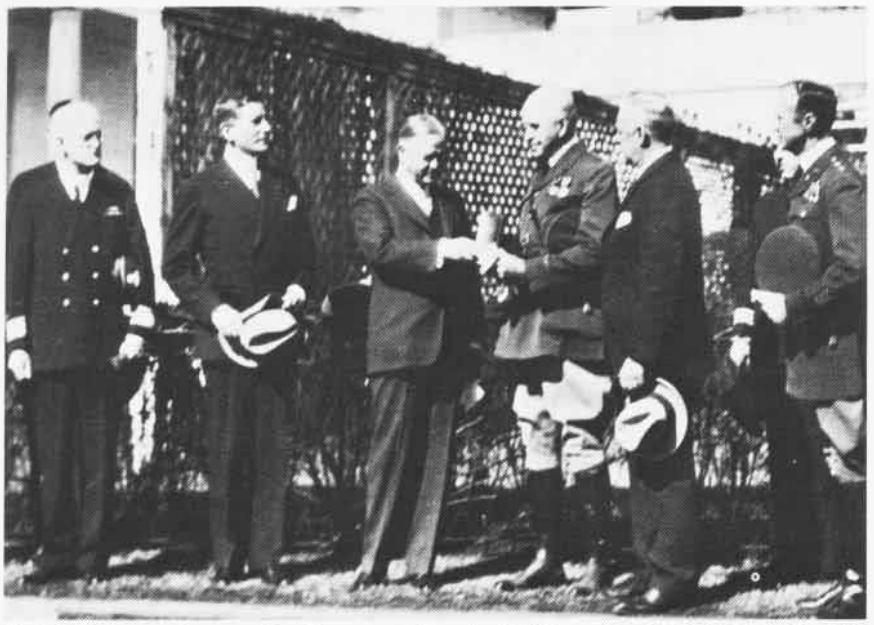
Ely successfully launched from USS *Birmingham* in November 1910 as the ship was anchored off Hampton Roads, Va. It was a widely acclaimed event. By agreement, Ely wasn't paid but he gained publicity which led to increased revenue for him. The achievement also demonstrated his patriotic spirit. Further, he had argued with fellow aviators that shipboard takeoffs were feasible. He proved his point.

Ely was on tour in San Francisco when approval was given to try landing a plane on a ship. He became the logical choice for the task and accepted it enthusiastically. The armored cruiser, USS *Pennsylvania*, was selected and a landing platform was built atop the ship at Mare Island.

The wood surface measured 120 by 32 feet and was elevated five feet at the forward end. A 15-foot, sloping ramp at the stern was designed to prevent the approaching plane from striking the fantail. Guard rails were rigged along the sides of the platform to corral Ely's 1,000-pound pusher, should it start to go overboard. A canvas barrier was erected at the forward end of the platform in the event Ely overran his mark.

The Curtiss biplane was modified with the addition of bays in the centers of both wings. This increased its span and provided additional lift at slower speeds. A pair of metal tanks were fixed to either side of the plane to keep it afloat should it crash in the bay. A hydroplane-like skid, mounted forward, was added to prevent nosing up if Ely had to ditch.

As the platform neared completion, Ely expressed reservations that he would be able to safely stop on it. Something more was needed. Numerous proposals were made. It was ultimately decided that an arrangement of lines, with weights on the end of



Ely's father, an Army colonel, accepted son's DFC from President Hoover in 1933.

them, would be used. Blacksmith hooks would be added to the pusher to snag the lines on touchdown.

There has been considerable conjecture through the years as to who actually authored this arresting gear idea. Ely had used a similar system to halt his racing cars; so, generally, he is given the credit. In any event, it was agreed to stretch 22 manila lines athwartships with 50-pound sandbags tied at the ends of each line.

Since money for the project had been totally depleted, Captain Charles Pond, the cruiser's C.O., and Ely himself purchased the material needed from their personal funds. Preparations continued.

The lines were set three feet apart and elevated by parallel timbers running the length of the deck. The timbers were 15 feet apart.

Ely practiced ashore, making precision landings and analyzing the technique of "trapping." At Tanforan, an airfield south of San Francisco, he stretched a rope across some two-by-fours and weighted the ends. He went about evaluating the swerving effect after engagement. He learned that unless the weights were precisely matched, especially if he hit the rope off center, he would angle dangerously to one side. Also, the hooks often skipped over the rope.

Finally, he procured three pair of spring-loaded racing-car hooks from a friend and arranged them in tandem. Tests continued. The system worked consistently on a number of tries and Ely was satisfied.

Everything and everyone were ready, except for the weather. An 1100 landing time was set. This would allow the sun to burn away the perennial bay area fog. For nearly a week, however, rain was logged on every watch aboard *Pennsylvania*. Finally, on the 18th of January the weather cleared enough and Ely made the historic first trap. A stickler for punctuality, the flyer touched down at 1059, only a minute off the scheduled recovery time.

When it was over, when the landing had been achieved, Ely displayed characteristic aplomb. His description of the feat was devoid of hoopla. This was in direct contrast to the multiple headlines in the January 19 edition of *The Call*, a San Francisco newspaper: "Air Monster Swoops to Warship's Deck; Ely Makes Naval History; Alights and Ascends; Conquers Wind in Greatest of Aerial Feats; Aviator Makes Daring Dive to the Cruiser."

Said Ely calmly, "There was an appreciable wind blowing diagonally across the deck. I had to calculate the force of it and found that it was not possible to strike squarely toward the center of the platform but on a line with the windward side of the ship. I had to take the chance that I had correctly estimated just how many feet the wind would blow me off course."

He went on, "Just as I came over the stern, as I shut down the motor, I felt a sudden lift to the machine, caused by the braking of the wind around the overhang. This lift carried me a trifle further than I intended before coming in actual contact with the deck."

When asked about the actual sensations he felt upon landing, Ely replied flatly, "There was no perceptible jar." He added, "There was never any doubt in my mind that I would effect a successful landing. While I didn't use up the entire platform, I do not think a smaller one would be entirely safe. I am convinced, however, that, had the ship been in motion and sailing into the wind, my landing would have been made considerably easier."

The flyer concluded, "I felt that I had not overlooked any details of the plans nor failed to take every precaution to make it a success."

It would be ten years before the first landing of a USN plane on an actual aircraft carrier. But, on the strength of that first trap aboard a surface ship, an era had begun. Eugene Burton Ely and the men of vision who supported him left a mark which is clearly visible today. That mark is personified each time a plane comes down from the sky and snags the wire of a flattop.

Sadly, Ely did not live long enough to realize the far-reaching impact of his achievement. Nine months after the landing, he was flying at the State Fair in Macon, Ga. During an aerial maneuver his controls malfunctioned and he crashed. He died minutes later, three days before his 25th birthday.

Mabel Ely was notified of her husband's death while in New York where she was securing passports for a journey to Russia. The Czar wanted to see Ely fly and had invited him to St. Petersburg for a demonstration.

On February 16, 1933, President Herbert Hoover presented the Distinguished Flying Cross, posthumously, to the ex-farm boy from Iowa.

NAVAL AVIATION 65 in '76

THE LOG ...

This chronology is the first in a series which will be featured monthly through 1976. The log entries represent salient events from the history of Naval Aviation.

1913 Entire aviation element of the Navy set up camp at Fisherman's Point, Guantanamo Bay, for its first operations with the fleet.

1914 The Aviation Unit from Annapolis (9 officers, 23 men, 7 aircraft, portable hangars, etc.) arrived at Pensacola to set up a flying school, LCdr. Henry C. Mustin, commanding.

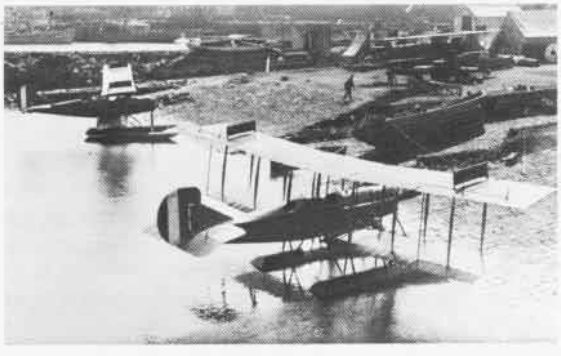
1916 First group of enlisted men began flight training at Pensacola.

OinC of Naval Aeronautics requested authority to experiment with aircraft radio.

1917 A Benet-Mercie machine gun was installed in a flexible mount in the Burgess-Dunne AH-10 and successfully fired at altitudes of 100 feet and 200 feet, at Pensacola.

Naval Observatory requisitioned 20 aero cameras and accessories, the first production order for aerial photographic equipment.

1918 First Marine Aeronautic Company arrived at Ponta Delgada to fly antisubmarine patrols over convoy lanes in the Azores. C.O. of the unit was Capt. F. T. Evans, USMC.



1919 Ens. F. W. Dalrymple and CMM F. H. Harris, at Miami, remained airborne for 9 hours 21 minutes in an HS-2L equipped with special gas tanks.

1920 Commandant, NAS Pensacola announced that all Naval Aviators or NAPs would be required to send and receive 20 words a minute on radio telegraph.

1921 SecNav approved a recommendation for development of radio-controlled aircraft.

1922 Parachutes were issued for heavier-than-air use — shipped to Marine aviation units at Haiti, the Dominican Republic, Guam and Quantico.

1924 VT-20 sailed from San Diego for the Philippine Islands to transfer to USS *Ajax* as the first air unit of the Asiatic Fleet.

1925 The Eberle Board gave prominence to aviation, recommending among other things: that *Lexington* and *Saratoga* be completed expeditiously, that a new 23,000-ton carrier be laid down and that a progressive aircraft building program be established to ensure a complete complement of modern planes for the fleet.

VF-2, first squadron trained to operate on a carrier, began landing practice on USS *Langley*, off San Diego. This also marked the beginning of *Langley* operations as a unit of Aircraft Squadrons, Battle Fleet.

1927 Flight test section established at NAS Anacostia.

LCdr. J. R. Poppen, MC, reported for duty in charge of the Aviation Medical School, Washington, D.C., the beginning of flight surgeon training in the Navy.

1928 First takeoff and landing on *Lexington* (CV-2), by Lt. A. M. Pride in a UO-1 as the ship moved from Fore River Plant to Boston Navy Yard.

First air evacuation, Quilali, Nicaragua. Lt. C. F. Schilt, USMC, flying an O2U-1, made ten flights evacuating 18 wounded officers and men in a three-day period. He received the Medal of Honor.

First takeoff and landing aboard *Saratoga* (CV-3), by Cdr. Marc Mitscher in a UO-1.

Los Angeles (ZR-3) made a successful landing on *Sara*, transferring passengers and taking on fuel, water and supplies.

1929 Experience in night flying became a requirement for all heavier-than-air Naval Aviators and Navy and Marine NAPs.

Fleet Problem IX began — the first fleet exercise for *Lex* and *Sara*.

1930 *Lex* completed a 30-day period during which she furnished electricity in Tacoma, Wash., after that city's power supply failed.

First successful air-to-ground glider flight — by Lt. Ralph E. Barnaby from 3,000 feet — from *Los Angeles* over Lakehurst.

1931 First rotary winged aircraft, XOP-1 autogiro, ordered from Pitcairn Aircraft, Incorporated.

1936 Bureau of Engineering initiated naval support to the Bureau of Standards for development of radio meteorographs (radiosondes) to be used to measure pressure, temperature and humidity of the upper atmosphere and to transmit that information to ground stations

JANUARY

for use in weather forecasting and flight planning.

Ranger, with 23 aircraft aboard, began three weeks of cold weather ops to determine effect of cold weather on operating efficiency, at Cook Inlet, Alaska.

1942 First lighter-than-air units of WW II, Airship Patrol Group One and Airship Squadron 12, commissioned at NAS Lakehurst.

Sara, operating 500 miles southwest of Oahu, hit by a torpedo and forced to retire for repairs.

VP-22, with PBY-5s, joined Patrol Wing One at Ambon, the first aviation reinforcements from Central Pacific to reach Southwest Pacific Force.

First combat patrols by aircraft in the South Pacific by VP-23.

SecNav authorized a Marine Corps glider program sufficient to train and transport two battalions of 900 men each.

1943 Naval Reserve Aviation Bases (NRABs), engaged in primary flight training, redesignated naval air stations.

First emergency use of GCA equipment, at Quonset Point.

1944 First U.S. attack with forward-firing rockets made against a German U-boat by two TBF-1Cs of Composite Squadron 58, from *Block Island.*

Occupation of the Marshall Islands began.

1945 Invasion of Luzon began.

1946 Naval Ordnance Test Station established at NAAS Chincoteague — to perform tests and modifications necessary for development of aviation ordnance and guided missiles.

1947 *Philippine Sea,* 660 miles from Antarctica, launched to Little America the first of six R4Ds which she had ferried from Norfolk as part of Operation *High Jump.*

1948 Headquarters, Naval Air Basic Training Command transferred to Pensacola from Corpus Christi. At Corpus Christi, Naval Air Training Bases disestablished and Naval Air Advanced Training Subordinate Command established.

1949 USS *Norton Sound,* first guided-missile experimental test ship, launched its first missile, a *Loon,* off the coast of the Naval Air Missile Test Center, Point Mugu.

CNO authorized conversion of all new construction cruisers to accommodate helicopters.

1951 TF 77 began a series of air attacks against rail and highway bridges along the east coast of northern Korea.

1953 Test operations aboard first angled deck carrier, *Antietam,* began when an SNJ landed aboard.

1957 ZPGs of ZW-1 began ten days of continuous radar patrol over the North Atlantic through some of the worst storms experienced in the area. Operating in relays out of South Weymouth, they evaluated all-weather capabilities of the airships.

1961 HMR(L)-262 recovered a *Mercury* capsule with the chimpanzee Ham after it completed a 15-minute flight, reaching an altitude of 155 miles and 420 miles downrange from Cape Kennedy.

1962 First air operations conducted aboard *Enterprise,* world's first nuclear carrier.

1965 *Lake Champlain* recovered an unmanned Project *Gemini* space capsule launched from Cape Kennedy in a suborbital flight 1,879 miles down the Atlantic Missile Range and within 23 miles of the carrier.

1971 A P-3C *Orion* began breaking records. BuNo 156512, a production model with no engine or fuel system modifications, established eight certified world flight records.

First *Harrier,* the first vertical takeoff and landing fixed-wing aircraft ever accepted for combat duty by U.S. armed forces, arrived at Patuxent River for BIS trials.

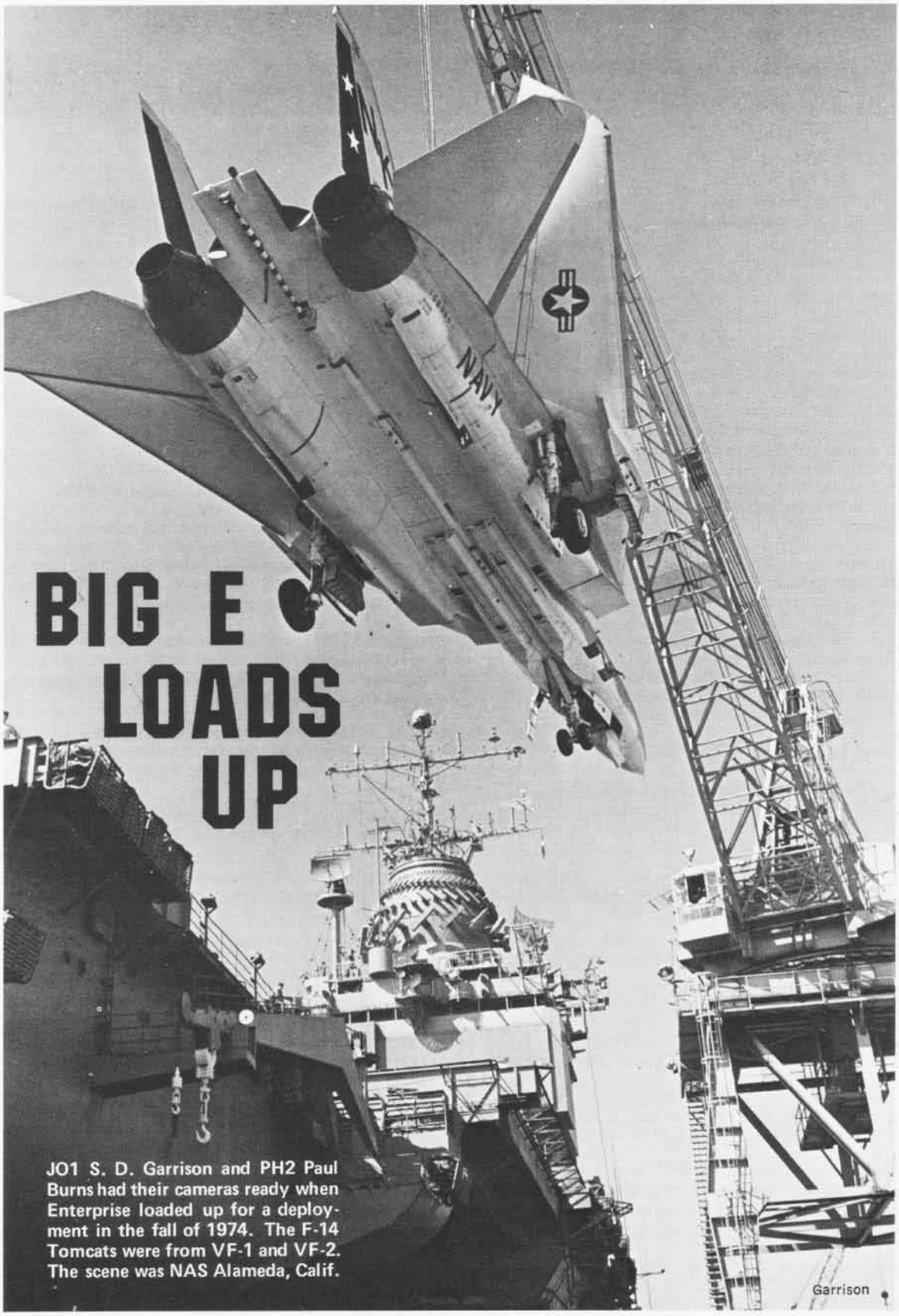
1972 112th MiG of the Vietnam War shot down. Lieutenants Randy Cunningham and William Driscoll, VF-96, made the kill in an F-4 *Phantom.*

1973 SecNav announced that eight women had been chosen to take pilot training at Pensacola.

Lieutenants V. T. Kovaleski and J. A. Wise, VF-161, shot down a North Vietnam MiG-21, the last kill of the war, making a total of 54 enemy planes shot down by USN pilots during the Vietnam hostilities.

TF 78 formed to conduct minesweeping operations in North Vietnam waters, code name — Operation *Endsweep.*

BIG E LOADS UP



JO1 S. D. Garrison and PH2 Paul Burns had their cameras ready when Enterprise loaded up for a deployment in the fall of 1974. The F-14 Tomcats were from VF-1 and VF-2. The scene was NAS Alameda, Calif.

Garrison


NK


Garrison


Burns


NK
USS ENTERPRISE
Burns

F2

Without question the tubbiest of U.S. Navy fighters was the F2F-1. Nevertheless it introduced a new era of carrier fighter performance when it went into service in 1935. Preceded by Grumman's first fighter for the Navy, the two-place FF-1, the F2F-1 took advantage of its predecessor's major design features, incorporating these in a single-place fighter aircraft. Except for its fabric-covered biplane wings, it incorporated all of the latest technology: all metal construction, twin row engine in a streamlined cowl driving a controllable pitch propeller, retractable landing gear and enclosed pilot's cockpit. The two-place fighter having been outmoded by 1933, the XF2F-1 prototype was the first of the long line of Grumman single-place fighters, including the *Cats* of WW II and later. Only the F7F *Tigercat* night fighters broke the single-place line prior to the return to today's two-place *Tomcat*.

Ordered in November 1932, the XF2F-1 prototype was first flown in early October of the following year. Starting Navy trials late in October, it concluded these trials some three months later when it crashed against the #4 turret of *Lexington* (CV-2) following an arresting hook failure. By that time the Navy report could read "In general the XF2F-1 was found to be the most satisfactory single-seat carrier fighter which has been submitted to the Navy."

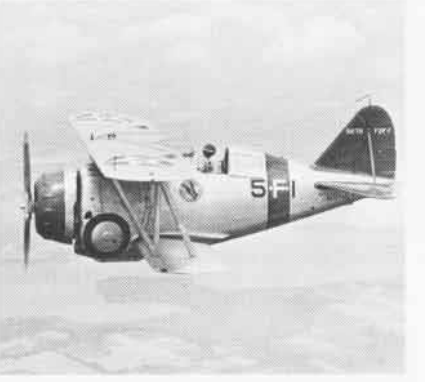
An order for 54 production F2F-1s backed up this evaluation (with one more subsequently ordered to replace an early airplane lost on a Navy ferry flight). These were to equip two squadrons — with spares.

The F2F-1 differed only in detail from the X airplanes, including a 650-hp P&W R-1535-72, replacing the 625-hp R-1535-44 of the X. The production airplanes continued the light two 30-cal. machine gun armament and no bomb carrying provisions.

Used to equip VF-2 and VF-3 (later VF-5), the F2Fs carried the colorful markings and insignia of the period. The "spares" were used to partially equip other fighter squadrons temporarily, including one Marine fighter squadron (VF-4M, later VF-2M) in the later '30s. F2Fs continued with the fleet until October 1940, subsequently ending their service in training duties.

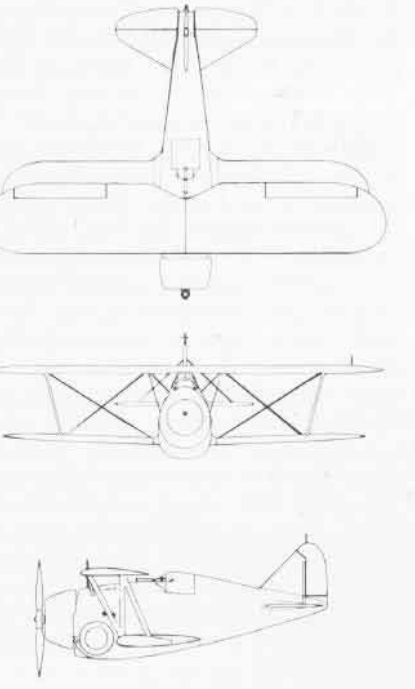
XF2F-1

F-1



F2F-1

Span		28' 6"
Length		21' 3"
Height		10' 6"
Power plant		
XF2F-1	P&W R-1535-44	625 hp
F2F-1	P&W R-1535-72	650 hp
Maximum speed		
XF2F-1		229 mph
F2F-1		231 mph
Service ceiling		
XF2F-1		29,800'
F2F-1		27,500'
Range		940 miles
Armament	Two .30 cal. machine guns	



BATTLE PROBLEM IX

A description of a fleet exercise as remembered by Vice Admiral J. R. Tate, USN (Ret.).

In the early Twenties, after WW I, the U.S. Fleet was reorganized into the Scouting Fleet, based on the East Coast, the Battle Fleet, based on the West Coast, and the Service Fleet. There was also a small Asiatic Fleet.

Usually in January each year the Battle and Scouting Fleets made a cruise to either Panama or Hawaii.

For these cruises, the War College prepared an annual Fleet Problem. These problems, besides exercising the various type commanders and their staffs, were used to accentuate the Navy's needs and requirements. All types of problems were involved including some hypothetical cases.

I remember one problem when a ship catapulted a seaplane off Panama. The pilot flew inland and landed at Coco Solo, announcing he was a squadron of bombers who had just bombed Gatun Locks!

During these problems, Hawaii was realistically and successfully attacked at least twice.

In Panama, the Pacific entrance of the canal was protected by mortar batteries located on islets along the channel entrance. It was discovered that there was an area behind the offshore islands which couldn't be reached by those batteries. During a problem, after the inter-battleship action, the ships would rush into that refuge under cover of darkness and bombard the Pacific end of the canal.

The mortars did not have the armour-piercing ability to counter the battleship fire, so the Army obtained a 16-inch naval rifle for installation on one of the fortified islets. In addition they established a battery of the same rifles in the jungle on the north side of the canal, to protect the blind spot.

But when the mount was prepared, the 16-inch rifle would not fit into the disappearing mount. It was eight feet too long! A decision was made to saw eight feet from the end of the gun. (This probably did interesting things to its ballistics.)

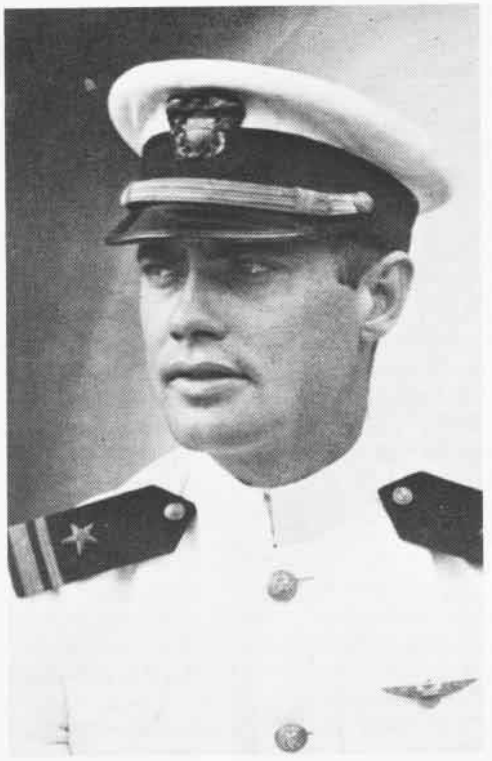
In February 1922, the Washington Treaty, which limited naval armament, specified that a ratio of capital ships of 5-5-3 would be established for Great Britain, the United States and Japan, with lesser figures for France and Italy. It also established overall limits for carriers.

The treaty also specified that any ships which were being built might be converted to airplane carriers if they fell within the tonnage allowed. At that time the U.S. was building six battle cruisers — 33,000 tons, 33 knots, 12 16-inch guns and five stacks. These ships, *Lexington, Saratoga, Constitution, Constellation, Ranger* and *United States*, were all electric driven.

In 1928, *Lexington* and *Saratoga* were completed as aircraft carriers and joined the fleet on the West Coast. Each carried an assortment of almost 100 planes. But they were too big to get into San Diego harbor and had to tie up at Long Beach. The squadrons were based at North Island.

Most senior officers thought that the only function of ships other than battleships or cruisers was to assist in bringing the battleships to a winning action. The battleship was paramount. Of course, Billy Mitchell and some crazy aviators talked about airplanes sinking battleships!

Naval Aviators fell into three gen-



Saratoga played key role during the problem which had a long-range, if not an immediate, effect on development of carrier aviation. Above, author as a lieutenant junior grade.

eral types: the shipboard people, who thought that the main function of aviation was to operate seaplanes from ships for scouting and gunfire spotting; the big boat pilots, the largest group, who thought that long-range scouting with large flying boats operating from a tender as bombers or torpedo planes would be the best use of aviation forces; and, finally, a very small group, led by Commander Kenneth Whiting, who believed that the carrier with an air group constituted the most effective use of aviation. Whiting even went further and expressed the thought that the carrier was not merely an assistant to the battleship but was an answer to it. It was possibly even a substitute. Commander Marc Mitscher agreed with him.

To the Navy of the late Twenties, the gun was paramount and the bigger the gun, the better. Until the arrival of *Lexington* and *Saratoga*, the air squadrons of the Battle Fleet composed a very minor unit.

ComAirons was Captain Stanford E. Moses. He was a non-aviator, as was most of his staff. *Langley*, a converted 12-knot collier, was the flagship. She had one VF squadron with 12 planes assigned. There were only two VF squadrons at the time. The other was on floats and assigned to the battleships.

There were two scouting squadrons of DH-4Bs and two DT-2 torpedo squadrons. These were in addition to a squadron of F-5L boats.

In 1928, with the arrival of *Lexington* and *Saratoga* on the West Coast, Capt. Moses was relieved by a brand new rear admiral, J. M. Reeves, also a non-aviator.

He came from the War College where he specialized in lectures on the Battle of Jutland. He was a very talented public speaker and above all a profound thinker. He was not tied down to the conservative ideas prevalent at that time.

Saratoga was his flagship and Cdr. Whiting his executive officer. Whiting had very definite ideas for the carrier mission. In long talks, he sold his ideas to Adm. Reeves on how he thought *Sara* and *Lex* should be used. Reeves absorbed Whiting's thoughts, including the theory of a circular formation with the carrier as guide and center. This tactical proposal completely disregarded the battleship column with its covering ships.

Whiting's ideas of the carriers' mission were radical to say the least. He did not consider *Saratoga* an auxiliary to the sacred battle line. He thought she was a primary weapon and said so in no uncertain terms. Reeves also had a few ideas of his own.

In the fall of 1928 the War College published the data and general conditions of Fleet Problem IX: an attack on Panama from the Pacific, scheduled for early in 1929. The Black attacking forces were the main units of the Battle Fleet. BatDiv 5, with *Colorado, West Virginia* and *California* and their 16-inch guns were the most important units. *Saratoga* was assigned to the Black attacking forces and *Lexington* was assigned to the Blue defenders.

Cdr. Whiting got the ear of RAdm. Reeves who, at a conference with the Black forces' commander, tried to present the ideas for using *Sara*.

When the squadrons reported aboard after commissioning, Whiting had directed them to train in launching, rendezvousing and proceeding out to an attack point, and returning and landing as a group.

The Whiting-Reeves plans for *Sara* had nothing to do with battle lines or guns. They proposed to attack with *Sara's* air group. The strategy was the product of Reeves' progressive thinking. But could his aviators do all the things that would be required of them?

All squadron commanders were summoned for a briefing. With only limited night flying experience and considering that it had never been done before, did they think it possible for the air group to take off from *Sara* at night, rendezvous and attack an objective at daylight? There would be an almost-full moon. The squadron commanders were enthusiastic and responded with a collective and emphatic YES!

Reeves then prepared his operation order. The problem would last a week and end at 0800 Saturday. *Saratoga's* fast attack force would remain well clear of the operating area. She would not be committed to the attack until the last few hours of the problem. Final run-in was programmed at top speed (31 knots). The air group would launch, rendezvous and strike the target at daylight, about 0600. Miraflores and Pedro Miguel Locks, Gatun Spillway, Gailliard Cut, Albrook Field and various gun installations were assigned as targets. Any enemy shipping was also fair game. After launching her aircraft, *Sara* would proceed at maximum speed to close the distance the planes would have to fly on return. Adm. Reeves took his operation plans to Admiral W. V. Pratt, the Black attack forces commander and CinCUS for approval.

Adm. Pratt said, "Never mind the details. I know there is controversy about your funny looking command. That controversy will be resolved by some committee in the coming years. You have all that flyer talent, what do you want?"

Reeves thought for a moment, then said, "Orders to detach *Saratoga's* striking force from the main body and to proceed and carry out this operation plan." Pratt said, "OK," and then, as an afterthought, "But if I were you, I wouldn't get far from the protection of BatDiv Five's 16-inchers." Reeves took his operation plan and quietly returned to *Saratoga*.

On the day before the problem started, just north of the Gulf of Panama, the *Saratoga* unit was detached to operate independently. She moved seaward and headed south. She was soon 1,000 miles south of Panama, well out of the problem area, anchored in the Galapagos Islands and holding swimming parties.

To the north, the problem proceeded. The Scouting Fleet located everything except the *Saratoga* force! For the first day or two, the main inquiry was "Where is *Saratoga?*" *Lexington*, operating with Blue battle line, ran afoul of BatDiv Five's 16-inchers on the first day and was sunk. The umpires, not desiring to lose the use of such a new and valuable ship, declared her a new carrier and in full operation again. On Thursday there was much discussion that *Saratoga* was probably out of the problem entirely.

Early Friday morning, *Saratoga* was in position to start the final high-speed run-in to the target. Planes were set to launch at 0400 Saturday. With the two plane-guard destroyers 5,000 yards on each bow and *Omaha* 8,000 yards astern, the formation slowly built up to 31 knots. There was a nice chop and a north wind. As speed increased, the plane guard destroyers were having a wild time. About noon, *Omaha* sent a message to *Saratoga*, "I cannot maintain this pace." She was told to drop out and proceed to Panama independently.

Late in the afternoon, *Detroit* was seen moving in on the starboard bow. She was enemy and started to challenge with her searchlights. Instead of answering her light challenge, Reeves sent her a message: "Form 180, 8,000 yards, 31 knots and if you can maintain position, establish yourself as

plane guard when we launch."

Detroit thought *Sara* was *Lexington* and struggled into position 8,000 yards astern of *Sara*.

After leaving her in that position for an hour, just as darkness fell, Reeves sent her another message, "You have been under fire by both my aft 8-inch turrets for 60 minutes and are adjudged sunk, *Saratoga*."

Detroit immediately opened up and informed Commander Blue Fleet about *Saratoga*, her plane-guard destroyers and their position, speed and course. Reeves protested — to the umpires — that *Detroit* was sunk and could not transmit messages. Nevertheless, *Detroit* fought all night to hold her position and to report *Saratoga's* movements. *Saratoga* thundered north, but the enemy now knew where she was.

At 0300 *Detroit* reported, "*Saratoga* turning up planes on deck."

At 0400, *Detroit* signaled to Commander Blue Fleet, "*Saratoga* launching planes." It was almost possible to read the incredulous tone of the message. It might well have been preceeded by, "I know you won't believe it, BUT."

Saratoga's air group launched without incident, completed the rendezvous and arrived at the target just at daylight, 0600.

The squadron had a holiday. The fighters strafed Albrook Field, found the planes neatly lined up with all the canvas weather covers in place. The AA guns were unmanned. Most of the large ships of the Blue force were heading for anchorage—the problem had only another hour to go. The dive bombers dove and attacked at will.

Realizing they were being attacked by planes from one of those funny looking carriers, Army Air launched an attack group which went out and found poor old *Lexington*. They sank her for the final time of the problem.

Sara proceeded in at top speed and, while recovering her planes at 0700, was sunk by the 14-inch guns of *Oklahoma* and *Arizona*.

Reeves' unorthodox use of *Saratoga* blew the lid on a great many things. There were many claims and counter claims, some from very high sources. He was accused of chicanery when he pretended to be *Lexington*. His feat would have been impossible in real operations.

Saratoga was immediately ordered by CinCUS to paint a broad black stripe on both sides of her stack to distinguish her from *Lexington*. Reeves protested, reporting his position after *Sara* was supposed to be sunk. Commander Blue Fleet claimed he had sunk *Saratoga* before the problem ended.

There was no doubt that emotions were running high. The umpires' reports were very biased as far as damage done by and to *Saratoga*. For example, when she opened fire on *Detroit*, she was penalized the loss of 30 planes due to gun blast. (She was carrying *Langley* planes in addition to her own, so this did not really diminish her air group.)

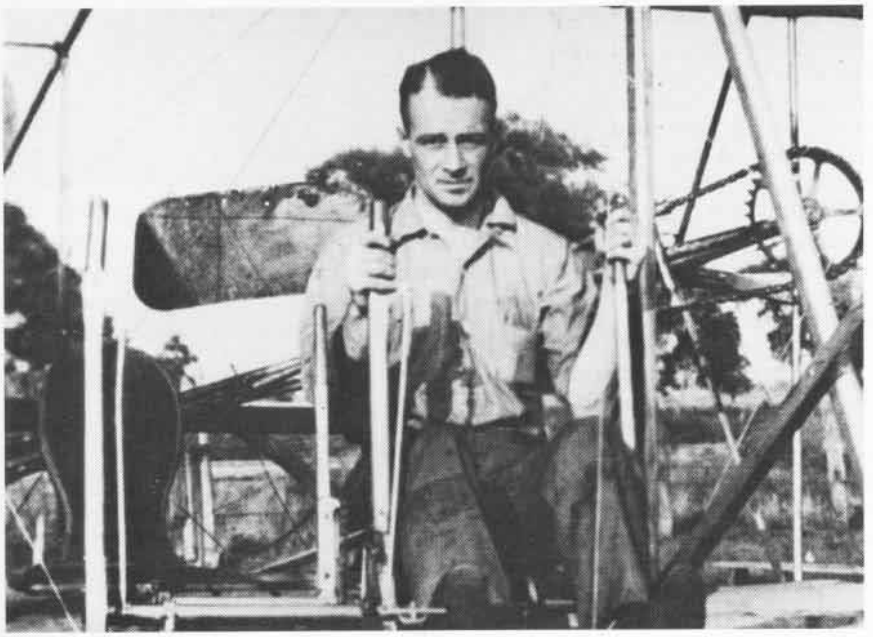
At the critique held two days after the problem ended, each major group commander was given time to discuss his operations. Normally, each would talk for half an hour. Reeves was allocated 15 minutes. At the end of ten, the officer in charge cut him off and closed the meeting.

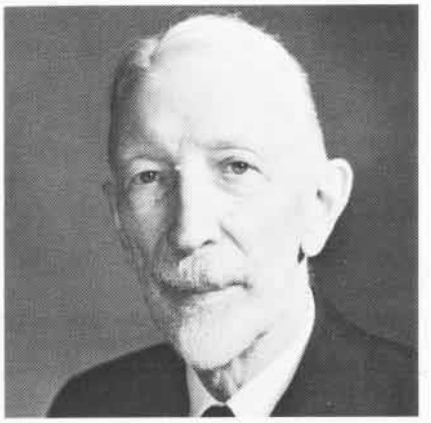
It was very plain that the senior officers did not like Reeves, *Saratoga*, those dirty carrier planes, dive bombers, torpedo planes or anything else. The Navy's long gun had been threatened.

The fast carrier task force had been born but the battle-line carrier was still an issue and would be for another three years.

The real pressure was not applied until the fleet arrived back in California. Reeves was detached and ordered to Inspector Naval Material, West Coast. This was about as small a job as an admiral could be assigned. Whiting was sent ashore. *Saratoga* was pretty well cleaned out.

Still, a lot of aviators who had other ideas about aviation suddenly became very carrier conscious.





Opposite page, although not taken during Battle Problem IX, this photo shows F4B-4s on Sara's deck with carriers Lexington and Ranger in background. Left, Whiting, as a lieutenant, at controls of a Wright Brothers plane. Nonpilot Reeves, above, was great advocate of carrier-based air power.

Patrol Squadron 26, attached to PatWingFive, helped save the life of a premature one-hour-old child by flying the infant from Bangor, Maine, to Boston, Mass.

A P-3, piloted by Ltjg. Art Tufts, was flying a routine training mission in the Bangor area when he and his crew were contacted by local authorities for medevac assistance.

A medical attendant met the plane in Bangor with the infant, who was experiencing extreme respiratory difficulties, in an incubator. The crew flew the child to Logan Airport in Boston where they were met by an ambulance which transported the baby to Massachusetts General Hospital. At last report, the child's condition was stabilized.

Approximately 65 ships and 17,000 men from eight NATO countries participated in Exercise *Ocean Safari '75* during November in the Eastern Atlantic and Norwegian Sea.

The time of year and operating areas were chosen to give NATO forces realistic training and experience in maritime operations under adverse weather conditions. In addition to operations at sea, the exercise included air support missions over parts of Northern Europe.

Designed to exercise, improve and demonstrate the readiness and effectiveness of NATO forces at sea and ashore, *Ocean Safari '75* had the objective of gaining and maintaining control of vital sea areas and providing carrier air support to the European allied command.

Participating in the exercise were forces from Canada, Denmark, the Federal Republic of Germany, the Netherlands, Norway, the United Kingdom and the United States. In addition, two ships and a maritime patrol aircraft of the French *Escadre de l'Atlantique* took part. Seagoing units included aircraft carriers, destroyers, replenishment ships and submarines. *Phantom, Nimrod, Vulcan, Buccaneer, Argus, Neptune* and *Orion* aircraft participated.

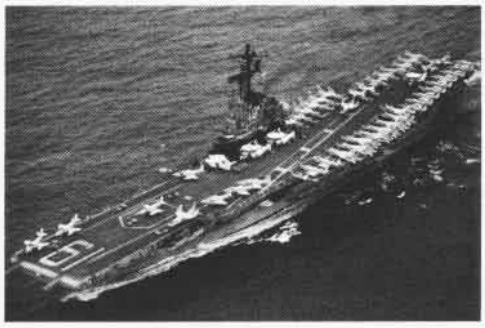
Midas Mufflers . . . your competition is showing. Not literally, but NAS Miramar is now in the muffler business. Giant, jet engine mufflers, that is. The NAS recently opened an Aircraft Noise Suppression Facility, the first of its kind in the U.S.

The facility, nicknamed the "Hush House," is a multi-purpose acoustical enclosure which allows maintenance personnel to test jet engines without letting the noise escape. F-4s, F-8s and F-14s are brought into the building, tied down and run through a programmed series of power settings to calibrate the engines. A 90-foot-long augmenter acts as a giant muffler to absorb most of the sound and heat produced during the tests. Baffles deflect the remainder of the noise.

After 31 years of service during which she logged 195,775 arrested landings, USS *Hancock* (CV-19) is scheduled for decommissioning early this year, as is her carrier air wing, CVW-21.

During her last deployment, *Hancock* assisted in the evacuations of South Vietnamese and Cambodians and the rescue of SS *Mayaguez*.

Hancock was awarded the Navy Unit Commendation and four battle stars for Pacific action during WW II. Her first battle operation was October 10, 1944, when planes rose from her flight deck for a strike against Okinawa airfields and shipping. Her planes also participated in the battle to retake the Philippines and in attacks on the Japanese mainland. On April 7, 1945, 62 of her crew were killed when a kamikaze plane crashed into her flight deck.



Hancock was awarded three more NUCs and three Meritorious Unit Commendations during the Vietnam conflict.

Her three A-4 squadrons, home-based at NAS Lemoore, are also scheduled for decommissioning. Included in this group are Attack Squadrons 55, 164 and 212.

Her F-8 fighter squadrons, VFs 24 and 211, have returned to Miramar where they are training in the F-14. VF-24 has

flown the F-8 since 1958 and has made 14 WestPac deployments.

The E-1B *Tracer* detachment from RVAW-110, the RF-8 photo *Crusader* detachment and the H-3 *Sea King* detachment from HC-1 will be absorbed by their parent squadrons.

VAW-126 has become the third Atlantic Fleet E-2 squadron to pass 10,000 accident-free flight hours. During the first quarter of FY '76, VAW-126 set a new squadron record by flying over 611 hours.

Fleet Composite Squadron Two, based at NAS Oceana, Va., recently completed 10,000 accident-free flight hours.

A new Aviation Supply Control Center (ASCC) has been established at the Navy's Aviation Supply Office (ASO) in northeast Philadelphia. ASCC is planned to give "instantaneous answers" to logistical problems in support of certain weapons systems through access to ASO's computer system and on-hand aviation expertise. Its mission includes improving the operational readiness and full systems capability of Navy and Marine Corps aircraft. A complete summary of ASCC's mission is in NavSupSysCom Inst. 5442.2.

VAW-78 has been assigned to CVWR-20 at NAS Jacksonville, changing its antisubmarine warfare environment to perform with a carrier attack group in the CV carrier concept. VAW-78 had been a member of CVSGR-70 since 1970.

Training Squadron 23 of Kingsville, Texas, has added a red, white and blue color scheme to a T-2 *Buckeye* to create its first Bicentennial Freedom Plane and also to depict early America's Minutemen and the flag they defended. Cdr. D. C. Troutman, C.O. of VT-23, stands beside the Freedom Plane which will become part of static displays at major bicentennial celebrations throughout the United States. The plane will also be used in training future Navy and Marine Corps Aviators.

HS-85, a reserve squadron based at NAS Alameda, recently received an overall grade of 95.6, the highest ever awarded by Commander Carrier Antisubmarine Air Group Reserve 80, on the squadron's operational readiness evaluation following two successive deployments to NALF Imperial Beach and aboard HMCS *Provider,* a Canadian oiler.

Patrol Squadron Eight, the first squadron to receive the P-3, has surpassed 100,000 accident-free hours in 12½ years.

This feat for VP-8, now on a split deployment between Rota, Spain, and Lajes, Azores, represents nearly 35 million miles of antisubmarine warfare missions.

Changes of command. *Blue Angels:* Cdr. K. S. Jones relieved Cdr. Tony Less.

VA-153, Lemoore: LCdr. R. P. Hofford relieved Cdr. K. S. Jones.

VA-192, *Kitty Hawk:* Cdr. G. R. Goldenstein relieved Cdr. D. Rogers.

VA-82, *Nimitz:* Cdr. D. P. Dunbar relieved Capt. P. V. R. Schoeffel.

VA-15, *Franklin D. Roosevelt:* Cdr. G. E. Evans relieved Cdr. H. P. Kober.

VA-25, *Ranger:* Cdr. P. W. Ogle relieved Cdr. G. R. Vezina.

VA-215, *Oriskany:* Cdr. J. J. Schultz relieved Cdr. R. D. Mixson.

VP-24, Jacksonville: Cdr. S. F. Gallo relieved Cdr. B. T. Hacker.

VP-92, South Weymouth: Cdr. N. R. Zanin relieved Cdr. J. R. Boling.

VF-14, *John F. Kennedy:* Cdr. C. L. Lavinder relieved Cdr. G. F. White.

VF-41, Oceana: Cdr. M. M. Scott relieved Cdr. D. A. Baker.

RVAH-5, Key West: LCdr. J. N. Henson relieved Cdr. G. W. Shattuck.

CVW-5, *Midway:* Cdr. J. L. Finley relieved Cdr. W. L. Chatham.

CVW-17, *Forrestal:* Cdr. D. E. Cramer relieved Cdr. T. P. Scott.

HSL-34, Norfolk: Cdr. R. L. Johnson relieved Cdr. B. W. Borgquist.

NAF Warminister: Capt. G. F. Murphy relieved Capt. A. C. Derrick.

"Better late than never" has a special meaning for Capt. Edward Monsour attached to Intelligence Ready Reserve Unit 106 of Washington, D.C. He recently received two awards from the government of the Republic of China, some 30 years late.

As a member of the *Flying Tigers* of WW II, Capt. Monsour was authorized the China War Memorial Decoration and also the Sino-American Cooperative Organization Service Medal. Due to the general confusion following the demobilization of U.S. armed forces in 1945, these medals became a matter of forgotten paper work and were never awarded.

Because of the interest and efforts of various persons serving in China, the paper work was recently reinstituted, the award authenticated and the decorations awarded.

Dr. Richard B. Kershner, who directed the development of the world's first satellite navigation system and the space program at the Johns Hopkins Applied Physics Laboratory, has received his fourth Distinguished Public Service Award. Dr. Kershner's contributions have led to a number of space vehicle firsts including the first operational geodetic satellite, the first satellite with multiple payloads and multiple orbits, the first use of nuclear power in space, and the first satellite with a drag-free orbit.

In 1958, Dr. Kershner received the award for development of the *Terrier* guided missile; in 1961, for contributions to the *Polaris* missile system; and in 1967, for development of the Transit Satellite Navigation System. His latest award is for "outstanding direction of the space development department of the Applied Physics Laboratory."

Lt. Robert D. Milne, a pilot with reserve squadron VA-203 at Jacksonville, has received the Air Medal for bringing his crippled, burning *Corsair II* back to the runway rather than abandoning it over the heavily populated West Jacksonville-Orange Park area.

Patrol Squadron 22 has received the CNO Golden Wrench Award which is presented annually to the Pacific Fleet patrol squadron that attains the best maintenance record during the calendar year. VP-22 deployed to Kadena Air Force Base from its home base at Barbers Point, Hawaii.

The Jacksonville Naval Air Rework Facility has been named winner of the Rework Excellence Award for FY 75. NARF Jax was cited for a 25 percent increase in efficiency involving the A-7 *Corsair* aircraft program and an outstanding record of schedule completions over a sustained period.

Lt. Jerry Watson of the *Fighting Aardvarks* of VF-114 was congratulated by his commanding officer, Cdr. Richard Parker, after Watson made his 400th landing on *Kitty Hawk* to become a *Hawk* quadruple centurion.

End of an era: Cdr. J. K. Kuehmeier, C.O. of VS-30, and Cdr. Vargas-Prada, Peruvian Navy, flew VS-30's last instructional flight for the Navy's S-2E/G readiness training squadron. Their flight marked the end of the Navy's reciprocating engine powered tactical aircraft training pipeline to the fleet. The last of these tactical recips is 22 years old.

With the introduction of the S-3A *Vikings* as fleet replacements for the *Stoofs* in February 1974, the West Coast S-2 RAGs transitioned and assumed an S-3A RAG role. This left VS-30 as the Navy's only S-2 RAG with all related training responsibilities for both Atlantic and Pacific Fleets. In addition, under the U.S. foreign military sales program, VS-30 was responsible for training foreign pilots, aircrewmen and maintenance personnel in S-2 tactics and systems.

First to be trained were the officers and men of the Venezuelan Navy, followed by Peru, Korea, Turkey and Brazil. This instruction enabled the trainees to return to their homelands and train others in the S-2.

PHOTO MARINES

There's an old squadron with a new name aboard MCAS El Toro. Marine Composite Reconnaissance Squadron Three (VMCJ-3), which has simply been called J-3 over the years, is now Marine Tactical Reconnaissance Squadron Three (VMFP-3).

More has changed than just the name. VMFP-3 now has the single mission of photographic reconnaissance. Its EA-6As have been transferred to Cherry Point-based VMAQ-2, formerly VMCJ-2.

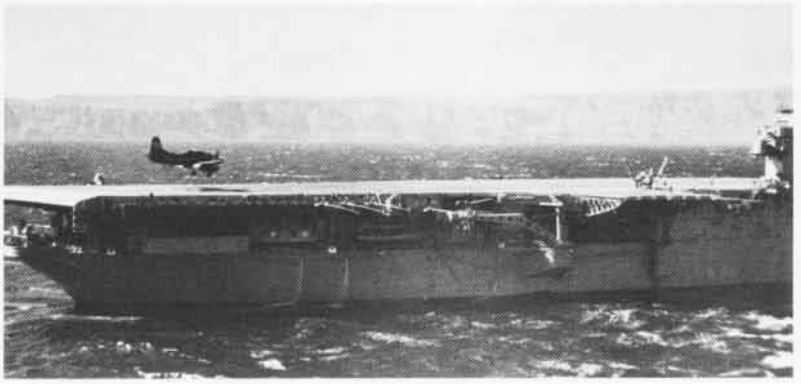
VMFP-3 now has all of the Marine Corps' RF-4B aircraft and is responsible for Marine photo reconnaissance. To carry out this mission, the squadron maintains aircraft and crews in the First Marine Aircraft Wing.

Commanded by Lieutenant Colonel John L. Watson, VMFP-3 represents the latest development in Marine Corps photo reconnaissance. Aircraft for this mission have ranged from the slow, four-engine PB4Y modified bombers of WW II to today's Mach 2 RF-4B *Phantoms*.

According to 1st Lt. Roy Stafford, squadron historian, General Roy S. Geiger, while on Guadalcanal, wanted a faster, more maneuverable photo-reconnaissance plane. He modified the F4F *Wildcat* for the mission. That was the forerunner of the Marine Corps' first single-seat photo-recon aircraft.

The Corps combined its photo and electronic countermeasures capability in late 1955 when VMC-3, El Toro, and VMJ-3, Miami, joined and became VMCJ-3 with the dual mission of photography and electronic warfare. J-3 flew many types of planes during its existence. They included the F9F-5P *Panther*, F9F-8P *Cougar*, AD-5N *Skyraider*, F3D-2Q *Skyknight (Willie the Whale)*, F8P-1P *Crusader* and EA-6A *Intruder*. The squadron averaged six weeks of deployment and four fleet exercises each year.

Solid Shield 1975 was the first exercise in which the squadron operated under the single-site concept of having all Marine reconnaissance aircraft centered in one unit. The exercise demonstrated VMFP-3's capability in its new role.



Some of J-3 planes are shown here: From top, Panthers over Biscayne Bay, Miami; Spad landing on Hornet in 1956; Willie the Whale and a Crusader over Mojave Desert in 1950s. Before El Toro had fresnel lens, LSOs were equipped with paddles, left.

ACTIVE DUTY

During its two-week active duty training last year, VP-68, NAS Patuxent River, Md., followed the mini-detachment program. Throughout the summer and into the fall, the reserve squadron scheduled two crews for each two-week AcDuTra period over a three-month span. Singly or in pairs, the crews were given an aircraft and sent to augment active duty squadrons at various locations throughout the North Atlantic. The more experienced crews flew directly to forward deployment sites.

Crew Six was skippered by LCdr. Harold A. Peterson, an airline pilot in civilian life. Since it was a relatively new crew, it needed some ground school refresher and flight simulator training before reporting to Keflavik, Iceland, for assignment to Commander, Icelandic ASW Group.

First the crew carried out a training mission with an "enemy" submarine. The mission highlighted the crew's strong points, and also those areas needing improvement. Lightning and thunderstorms in the Patuxent River area delayed aircraft fueling, so takeoff was later than planned. This shortened the on-station period. Although the crew was preparing to localize the "unfriendly" submarine, the delay left no time to attack the target.

Instead, the crew flew to NAS Brunswick, Maine, for debriefing at the Tactical Support Center. This completed, there was another delay before the return flight to Patuxent River — a starter valve was stuck and required repair. Arrival at Patuxent marked the end of a long first day for Crew Six.

Much of Sunday was spent preparing for the next leg of the journey which carried them to NAS Willow Grove, Pa. They arrived that evening for four days work at the Reserve ASW Tactical School. As they approached the naval air station, the crew members were awed by the immensity of the tragic fire which was still burning at the Gulf Oil refinery in Philadelphia.

At Willow Grove the crew was divided into groups by crew positions to begin individualized instruction: the ordnanceman received training in the P-3 ordnance system and its maintenance; the two acoustic sensor operators in airborne trouble-shooting on sensor equipment; the radar/MAD operator in the application of his sensor equipment; the pilot and NFOs in oceanography, ASW tactics and submarine intelligence. The pilots completed their days with proficiency flights, while the NROs received additional training in data extraction from the various sensor stations.

Finally, the crew embarked on the short flight to NAS Brunswick for the

Photos by AW3 Morgan Wilb

TRAINING

next segment of its training. This began early Friday morning with a series of lectures and films on aviation physiology. There was also a period in the low pressure chamber to familiarize the aircrewmen with the dangers of hypoxia. Such refresher training is a requirement for all personnel and was an important step for this new crew. During the afternoon each man preflighted his equipment on LW-9 which had arrived from Patuxent River. LW-9 was the aircraft assigned to the unit for the remaining week.

As a final preparation before leaving for Iceland, the crew worked on simulated ASW problems in the weapons systems trainer. This helped develop the skill needed to ensure team coordination in prosecuting a subsurface contact. Gradually the rough spots were smoothed. The crew was now a team.

With a week of hard work behind it, Crew Six flew on to Iceland to test itself operationally. En route, the rugged beauty of Greenland and its icebergs was a spectacular sight. Cameras clicked often. Finally, they were in Iceland. The windblown biting cold and dampness enveloped them. Before retiring to their quarters, the men were told about local customs and law by the duty officer of the host squadron, VP-16.

Monday morning they were briefed on operating procedures in the local area. Such a briefing anticipates many problems for those unfamiliar with Iceland. The crew's first operational flight took it well north of the Arctic Circle and new members of the Royal Order of the Blue Nose were inducted.

A surveillance flight to the Norwegian Sea began with an early morning brief and takeoff. Midway in the flight a message was received changing the destination from Sola to Orland Airfield, Norway. None of the crewmen had ever been there and the prospect was exciting. Their Norwegian hosts provided accommodations, including transportation to the ferry which took them up the fjord to Trondheim for a day of liberty. The beauty of the scenery and the warmth of the hospitality they found in Trondheim were a highlight of the cruise.

Upon completion of its mission, which included the tasks assigned to a regular Navy squadron, the team departed Orland Airfield for another surveillance patrol between Norway and Denmark before returning to Keflavik.

Little time was lost in preflighting the aircraft for the trip home. The hot and humid weather which greeted the crew at NAS Patuxent River was in sharp contrast to the wind and cold they had left behind in Iceland.

By Lt. John Daly

RDT&E

By Bryce Royalty

Today's Navy research, development, test and evaluation (RDT&E) aircraft are managed by the Naval Air System's Director, Test Activities (Air-O6T), Patuxent River, Md. But it hasn't always been that way.

Prior to 1968 there was no single source where information on RDT&E aircraft could be obtained. Management control of some aircraft was delegated to individual divisions within the office of the Assistant Commander for Logistics/Fleet Support. Lines of authority overlapped within other offices of NavAirSysCom, with program managers and even with field activities. Coordination of funds for projects and for aircraft maintenance support was nonexistent.

It was evident that an improved method of monitoring, reporting and reviewing the status requirements and usage of RDT&E aircraft was needed. Long-range projections on planned future aircraft and weapons systems were also needed for more realistic planning, programming and budgeting.

Today, Air-O6T is controlling custodian of RDT&E and station-flying aircraft. This includes the acquisition, assignment, projection of future requirements, compilation of daily reports on status, configuration and past utilization, rework program planning and execution and, finally, disposition.

In addition to aircraft that are permanently assigned to RDT&E, Air-O6T obtains temporary aircraft as requirements dictate. For example, prototype aircraft (usually two) are assigned to evaluation teams. Additional aircraft from the limited-production phase are also made available. The Military Aircraft Storage and Disposition Center, Davis Monthan AFB, Ariz., and the fleet are also sources of RDT&E aircraft used for temporary assignment. Air-O6T monitors the transfer, the progress of the project, maintenance and the timely release of the aircraft.

RDT&E aircraft are, individually, mobile; collectively, a fluid group. They move from project to project, from activity to activity, in and out of rework facilities, contractors' plants, storage facilities and the fleet (in the case of temporary fleet assist aircraft). Air-O6T coordinates these assignments and, in many instances, is the final link in the approving chain.

Which activity gets which aircraft is the central question. The aircraft program data file (APDF) lists permanent assignment of aircraft. Air-O6T makes regular updating inputs to that OpNav publication. Air-O6T is the central authority on the aircraft requirements of all field activities.

Air-O6T also makes inputs to the weapons systems planning document (WSPD) and then uses that document when making aircraft assignments. WSPD provides direction and guidance for the acquisition, development and operational support of naval weapons systems. It presents the approved plan for a given aircraft or airborne weapons system.

The Navy deals with numerous vendors in the acquisition of hardware and computer software. In many instances, the Navy loans aircraft (usually from the RDT&E inventory) to civilian aerospace firms for the purpose of testing specific concepts or hardware. This giving of physical custody of RDT&E aircraft to non-military organizations is called bailment. (New production aircraft are not subject to bailment procedures.) Usually a program manager requests the bailment. The release of a Navy aircraft, normally worth millions of dollars, to a non-government activity, must be carefully evaluated.

Then, before any Navy aircraft can

be delivered to a contractor's facility, a procurement request, project agreement, bailment agreement and bailment letter must be issued. Legally no work on a Navy aircraft can be initiated until these documents have been completed and signed.

Once the paper work is completed and the aircraft is delivered to the contractor's plant, Air-O6T (which retains control) monitors the status, utilization and maintenance associated with the aircraft. Once a year, O6 reviews each program, supported by either the defense contracts administration services office or a naval plant representative at the contractor's site.

Determining future requirements for RDT&E aircraft is an on-going task, a necessary part of planning and programming. Air-O6T reviews and approves assignment of air tasks, work units and procurement requests while staying abreast of the latest changes in various programs. The division also monitors procurement requests, technical development plans, decision-coordinating papers and test and evaluation master plans. A source of useful information is the monthly usage reports prepared by all activities.

The Director, Test Activities has daily liaison within NavAir, OpNav field activities and the contractor and government offices at the contractor's plant. A file, by type and bureau number, on each RDT&E aircraft includes bailment and project agreement, authorization letter, NavAir forms 13050/7 (aircraft configuration), discrepancy reports, accident/incident and safety UR reports and miscellaneous correspondence. Quarterly, the division receives from each reporting custodian OpNav Report 5442/6 — aircraft accounting audit report (by bureau number and model).

The activity determines who will pilot or ride, as crewmen or passengers, military, civilian, VIPs, foreign nationals, etc., in RDT&E project aircraft to accomplish the tasks assigned to the reporting custodian. The division has published an instruction which designates approving authorities and provides the guidelines when there is a question as to who may operate or ride in the aircraft.

Scheduling overhaul of RDT&E aircraft is another O6T function. Each aircraft, whether RDT&E or fleet, has a prescribed operating service life. This "life" is determined by total flight hours converted into service months and is divided into service periods of specific lengths based on the required frequency of periodic depot level maintenance. Naval air rework facilities are reimbursed by O6T for maintenance (mainly inspection, repair and replacement) from allocated funds.

The activity pays for itself in its judicious disposition of RDT&E aircraft. Many of the aircraft are prototypes with hand-built, one-of-a-kind systems that are hard to maintain. These and other less-than-optimum aircraft are constantly being taken out of the inventory. Between 1972 and 1974, 21 different models were removed from RDT&E status.

Information on how to dispose of the equipment removed from the aircraft and on how to restore aircraft prior to reassignment is contained in an Air-O6T-originated instruction.

Today the problems of managing RDT&E aircraft can be broken down into two categories: quality and quantity.

Quality problems are essentially maintenance problems. Students of Navy material life cycle (including the relationships between time, expenditure and the uncertainty of a weapons system life cycle) will point out that chronic maintenance problems are the result of false economy in the engineering development phase. The DOD Deputy for Test and Evaluation expressed it this way: "In the long run, taking short cuts during T&E to save time and money will result in significant increases in the overall cost of the programs and in the delay of the delivery of the corresponding weapons systems to the combatant forces."

Maintenance problems can often be equated with money or, more properly, with the lack of money. The lack of money means that aircraft operate for longer periods between overhauls, that the quality of the overhaul is lowered and that fewer trained personnel are available to adequately maintain the aircraft.

Many RDT&E aircraft are prototypes rather than normal-systems aircraft. There have been occasions when the expediency of the situation has resulted in a prototype being assigned as a test and evaluation aircraft. This results in test data that is not representative of a full-up-systems aircraft, i.e., a fleet squadron aircraft.

The high cost of instrumentation/de-instrumentation often results in the use of less-than-desirable aircraft. (Management has to work around these situations as they occur.) Actually, prototypes are so limited in their usefulness that they should be replaced by fleet-system aircraft.

Air-O6T tries to supply each activity with the correct number and model of aircraft it needs for the time needed. In an effort to obtain the best result for each dollar spent, the director considers contractual commitments, project directives, funds, maintenance manpower deficits, fuel funds and the overall cost.

Sound management practices are a necessary part of the control of 291 RDT&E military aircraft. In the ever-important business of balancing NavAir assets (aircraft, funds, ground support equipment, etc.) against the requirements of Navy field activities and aircraft manufacturers, Air-O6T is continually looking for ways to increase the efficiency of Navy's RDT&E efforts.

This includes identifying field activity responsibilities, examining areas of unnecessary duplication and developing a master plan for aircraft assignment for each field activity. The result is a better basis for allocation of aircraft, manpower, funding for projects and military construction and workload assignment.

THE AVIATION MACHINIST'S

Instead of a long 8,000 feet of runway to set down on and 4,000 to take off from, the carrier pilot settles for 300 feet to land in and 50 less to launch. His finely-tuned engine thunders to an open-throated roar as his plane sits like a pellet in a giant slingshot.

After his catapult launch he flies a mission and returns for the crucial final landing.

"You're looking good," says the LSO. "Check your lineup. A little power. You're going low. Don't go high. You're still high. Wave off!"

Booming away from his pattern, the pilot accelerates his engine to full power. As the deck crew scurries against a 30-mile wind, other planes are tossed off the boat with clockwork precision.

To keep its aircraft engines operational, the Navy relies on green-shirted specialists who wear the winged-propeller rating badge and bear the marks of wires and wrenches. Their scarred hands tell much about their trade.

On aircraft carriers at sea and at naval air stations ashore, Aviation Machinist's Mates (ADs) inspect, test and make major repairs on all aircraft engines — including induction, cooling, fuel, oil, propeller, compression, combustion and exhaust systems. They fine tune fuel controls, pumps, valves, regulators and carburetors.

ADs trace fuel lines for leaks and repair propellers and helicopter rotors. They lube, refuel and warm up engines and clean, adjust and repair smaller components.

The chief, first and second class Aviation Machinist's Mate rates were established in 1921, before the third-

MATE

ENLISTED RATING SERIES

By Bob Moore

Shore-based ADs like ADJ3 Walter M. Wilson, far left, repair millions of dollars worth of jet engine defects. Above, Wilson checks out an F-14's lubrication at VF-143.

class pay grade began (in 1926). Today, there are two types of ADs: ADJs work with jets and ADRs handle piston-driven reciprocating engines.

Both types of ADs sweat in the hot tropics, shiver in subzero arctic areas, or pitch and roll on carrier decks to keep the power plants of Naval Aviation in tune and trim.

Of all the Group IX aviation ratings, none requires more knowledge of more subjects than the Aviation Machinist's Mate. To thoroughly understand aircraft engine maintenance, ADs work with illustrated parts breakdowns, aircraft service changes, power plant bulletins, technical information maintenance instructions, and a broad spectrum of data from the 3M maintenance system.

When airborne, an AD crewman computes the fuel-consumption and switches gas tanks while monitoring his aircraft's engines. In carrier shops at sea, a squadron ADJ may nurse planes by blending compressor blades, replacing turbine assemblies, checking combustion chamber lines, repairing fuel pumps, fixing fuel tanks and testing engines.

Much of his working area is taken up by engine work stands. Each stand can hold an engine. Each engine may be moved easily by an overhead track hoist.

When an engine is ready for its final tune-up, it is hoisted onto a portable platform and rolled to a testing area on the ship's fantail. Fifteen feet from the fantail testing stand, in a small soundproof booth with a six-inch shatterproof window, a test cell operator watches the mounted engine's 40-minute run. After the engine has cooled, it's ready for reinstallation.

Testing and installing a new engine may require 100 AD man-hours.

When a shop crew works on a major reassembly project, it expects to spend from 300 to 600 man-hours on a single engine.

At a jet test shop ashore, an ADJ wheels out his portable tool chest, selects the proper wrench and begins work on a power plant from an aircraft. These shore-based ADs find and repair jet engine discrepancies. For some tasks they work in an atmosphere where temperature is con-

stant, humidity controlled and dust is kept at a low level to protect the exposed turbines.

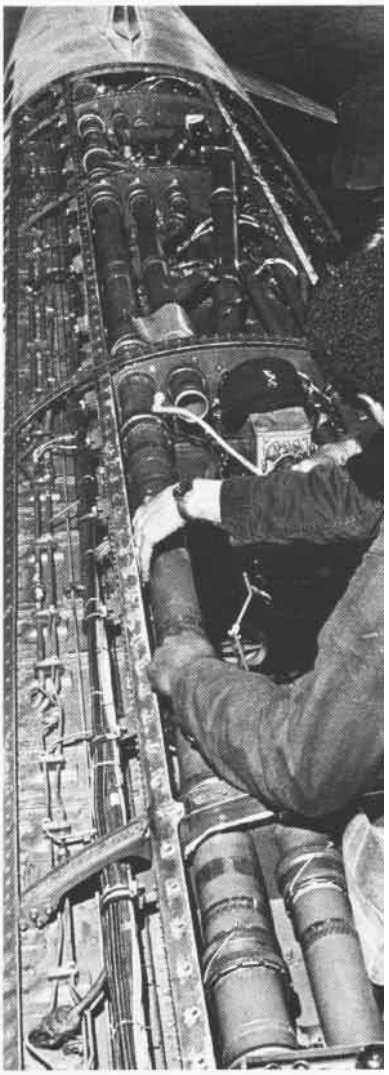
A senior Aviation Machinist's Mate operates the massive control panel that puts power plants through their paces. Using sensors placed on the engine, the AD checks for vibrations. He uses electronic eyes to search out other defects in each area where a problem could develop.

The test cell crew is an elite corps whose members check every overhauled engine. They work in a thick-walled structure where ducts run through the roof to supply air for turbines that could turn their buildings into a vacuum chamber. Opposite these ducts is an exhaust system where water is sprayed into superheated air for cooling and to help prevent air pollution by exhaust gases.

ADJs in A School learn the construction and operation of engines by studying blueprints and schematic diagrams. They are trained in basic math in order to solve aircraft loading, balance and weight problems. They study service maintenance, engine repair and the use of hand and power tools.

Graduates of ADJ School go through an organizational powerplants and related-systems maintenance course. After studying the theory and operation of the engine, they learn how to troubleshoot. They perform a phase inspection every 200 flight hours.

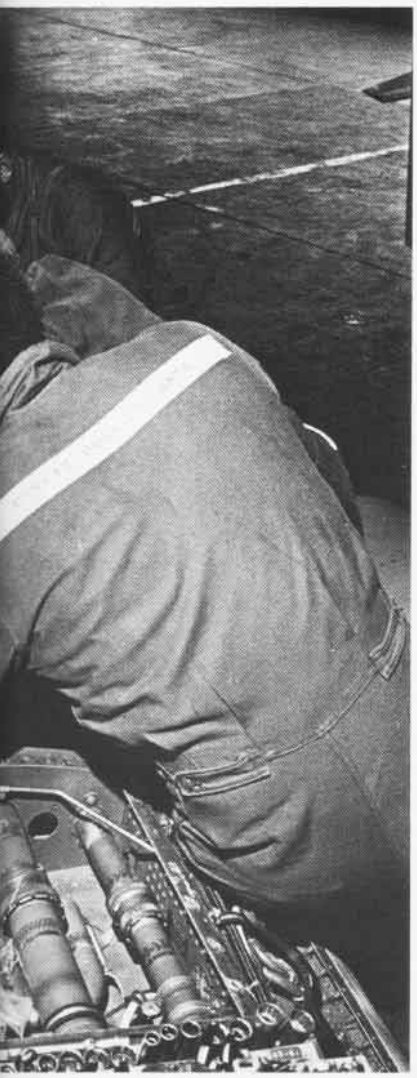
In the Navy's modern maintenance system, a failed unit is removed from a plane and turned into an aircraft



The Parable

And so it came to pass that on the 13th hour in the land of burning concrete, the weary lay down their wrenches and lifted up their voices toward the cubicle from whence cometh all maintenance wisdom.

And as the benders-of-the-wrenches were so assembled, their prayers produced a great clamor and a lamentation arose from their midst. They were weary of limb, sore of foot and heavy of eye, for great were their toils.

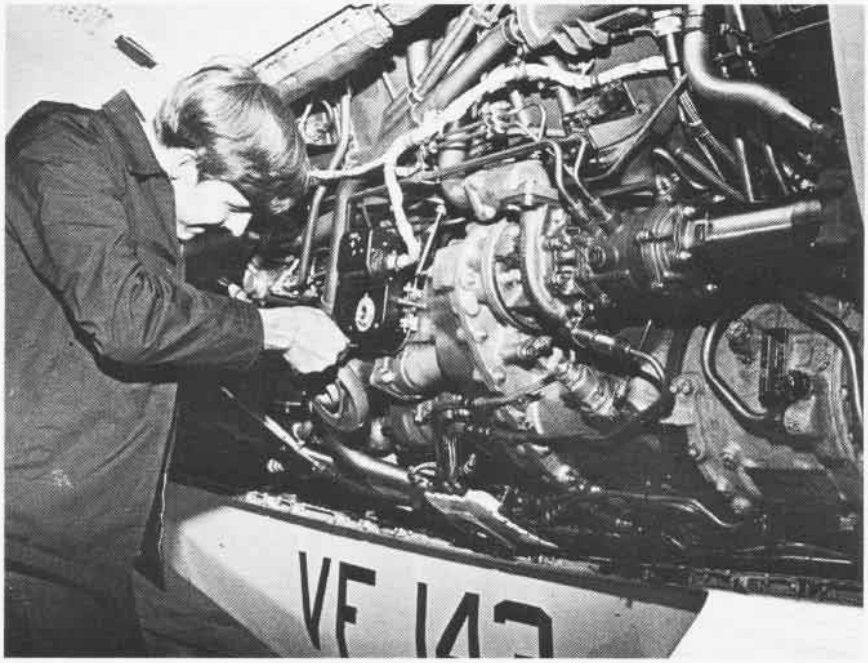


intermediate maintenance department (AIMD). If the AIMD cannot repair the item, it is forwarded to a designated overhaul point — like a contractor's plant or a naval air rework facility. This system centralizes expensive service equipment, promotes specialization and reduces logistic costs.

The trainees also study refueling, defueling and fuel transfer. They learn how to operate a fuel panel in flight, on a training device that works like the real thing. Through viewing panels, students see cleaning solvent and red-colored hydraulic fluid resembling fuel in an actual system.

The auxiliary power unit (APU)

Small parts like this hot-air valve, far left, are never overlooked. ADJs look in over the top of F-14 prior to repairing a fuel cell, left. Wilson works amid a mass of pipes and wires at Oceana, Va.



of the Wrenches

There came a huge hush over these multitudes as the hallowed portals of the cubicle opened and forth from his sanctuary strode the ADJC Shop Chief. And the chief spake in a riddle of reports, saying: "Return ye to thy labors and on the second Sunday of next week, ye shall know an hour of respite."

But a brave bender-of-the-wrenches arose and made a great harangue against the chief, saying: "Surely thou has not so soon forgotten thy promise that on this day thou wouldst give us rest!"

The chief became exceedingly wroth and spake in a thunderous voice, saying: "Be thou accursed, for great is thine ingratitude. Henceforth thou shalt maintain engines two-fold while cotter pins shall be denied thee. And ye shall forage for parts throughout the breadth of the lands and the seas, while I send maintenance inspectors to work my mischief amongst thee!"

And the benders-of-the-wrenches whimpered and quaked, saying: "Verily, we shall now know all manner of maintenance maledictions." And great was their fear.

While the benders-of-the-wrenches rent their clothing and sat in ashes, the ADJC reviled them further, saying: "I will turn my face from this flapped-wing place." And so saying, he went hence and abided for many cool hours where the river of spirits flowed gently on his mind.

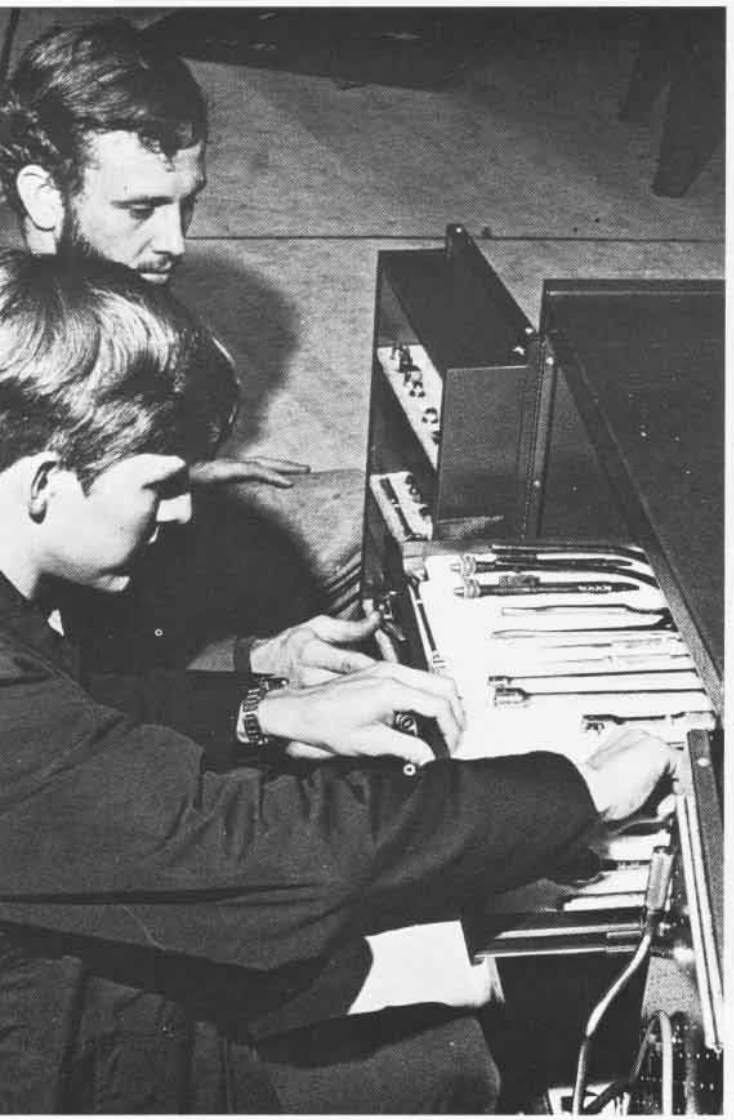
Photos by PHAN Ken Arkwell
Atlantic Fleet Audio-Visual Command

is the last phase in the power plants course. This unit produces electrical power, pressurization and air conditioning. After learning the use of the APU, the ADJs are ready to turn up an engine.

The ADR trainees learn everything from prop removal to control rigging of assembly parts. They work on ignition systems, becoming familiar with everything from the induction vibrator to the magneto. They learn aircraft hardware—the purpose, application, identification and nomenclature of every type of bolt, screw, stud, nut, pin, washer and wire. They study everything from tearing it down to building it up.

But ADR schools are phasing out. Because of the increasing demands for more speed and longer range, reciprocating engines are rapidly disappearing. The Navy plans to be out of piston-driven engines by 1979

Wilson and ADJ2 David Shoemaker select tools to complete their job, far left. For other jobs there are other tools, below. Wilson and Shoemaker work on an engine which has been removed from an aircraft in the hangar.



NAVAL AVIATION NEWS letters

Photo Request

PHC(AC) Robert L. Lawson, a frequent contributor of stories and photographs to *NANews*, is preparing a book on U.S. Navy, Marine Corps and Coast Guard aircraft since Pearl Harbor. He is asking for pictures of any planes in those three branches of the service from 1941 to the present.

He asks that planes be accurately described as per specific designation if possible. He will treat all photos with care and give credit lines as appropriate. All photos will be returned promptly after reprints are made.

You can send your photos to Lawson at 5126 Central Avenue, Bonita, Calif. 92002.

Invitation

The Navy Helicopter Association invites representatives of industry and the military to submit papers for presentation at its annual symposium to be held in San Diego in May 1976. Papers of both general and limited interest, not to exceed 30 minutes, will be welcome on any subject related to helos. Authors of papers selected will be notified by February 15.

Abstracts should be submitted to: Navy Helicopter Association, NALF Imperial Beach, Calif. 92032, Attention: Lt. Bruce M. Hoeller.

HC-7

Being an ex-SAR crewman, I liked your article "End of Big Mothers."

HC-1 was my old squadron, but while in combat SAR, HC-7 was formed and I was attached to it in WestPac. While on a rescue mission over NVN to rescue an Air Force pilot, fire was so bad we couldn't get close. When we noticed we were losing most of our fuel, we left the scene and headed for the closest beach.

Flying at 6,500 feet, with our fuel exhausted, we autorotated into the water about a mile off the beach, among the rocks. The helo sank but we were rescued by another helo. Only the pilot and I were injured.

The point is, you said HC-7 lost no aircraft, but it did—an H-2B, #27.

Gary L. Fleck, AMH1
VT-22
NAS Kingsville, Texas

Aviation Boatswain's Mate

In the article, "Aviation Boatswain's Mate," in the August 1974 issue of *Naval Aviation News*, there was little mentioned about the hangar deck other than shoving the aircraft onto the elevator to be taken to the roof.

I think it's about time we receive some recognition for the real job we do. Did you know that V-3 is manned by 45 percent of the ABHs aboard ship, that we are responsible for the upkeep of all fire-fighting equipment on the hangar deck; manning conflagration stations 24 hours a day and for half the elevators' operations. I could go on but I believe I've stressed the point.

So when the flight deck becomes clobbered with aircraft or heavy maintenance is to be performed, it comes down to us. Although our job may not be as glamorous, it's just as important.

Harold Kruzan, Jr., ABH2
V-3 Division
USS Kitty Hawk (CV-63)
FPO San Francisco 96601

Ed's Note: Thanks for drawing our attention to the vital work of the ABHs on the hangar deck. We certainly didn't intend any slight of your operations. Perhaps we got caught up with the available photography and the "ringmaster" analogy. We appreciate your comments.

Big Mothers Legacy

The article by Ltjg. Larry D. Nikolaus, "End of Big Mothers," in the August 1975 issue of *Naval Aviation News* was very captivating and, in my opinion, accurately conveyed the epic and essence of HC-7.

On August 1, 1975, HC-7's mission and responsibility passed to the shoulders of the Naval Air Reserve, embodied in HC-9, the Navy's *only* combat search and rescue squadron.

Although the disestablishment of this great squadron is proper cause for reflection, the officers and men of HC-9 take cognizance of the illustrious record of achievement and accept this as their legacy and challenge.

M. E. Malone, Cdr., USNR
C.O., HC-9
NAS North Island
San Diego, Calif. 92135

Fuzzy Fuses

I just read the April 1975 issue and, with special pleasure, Bob Moore's article on AOs. The gear is much different than in my day, but the hernia work looks much the same.

Couple of technical points: bombs, rockets, etc., don't have fuses. They have fuzes. According to old OP4, the definition was established by Act of Congress and I once had to prove the point when writing Vol. 1 of the first AO3 & 2 manual at TraPubCen Memphis in 1953-54.

Air-arming fuze arming wires are equipped with Fahnestock clips (with an E, that is), and the Navy hasn't had cannons since the old smooth-bore days when G. Pettibone was a bull ensign. (Sloppy Air Force and Army usage notwithstanding.)

Point of interest: The first solely AO school was at what is now NATTC Jax and the very first class convened on March 3 or 4, 1941, (I was assigned as an apprentice seaman) with a warrant gunner in charge and three or four instructors.

Hugh Compton AOCS, USN (Ret.)
4450 Dickens Ave.
Titusville, Fla. 32780

Ed's Note: Our spelling of fuzes and Fahnestock was fuzzy but 20mm guns are commonly cannonized.

Firebirds

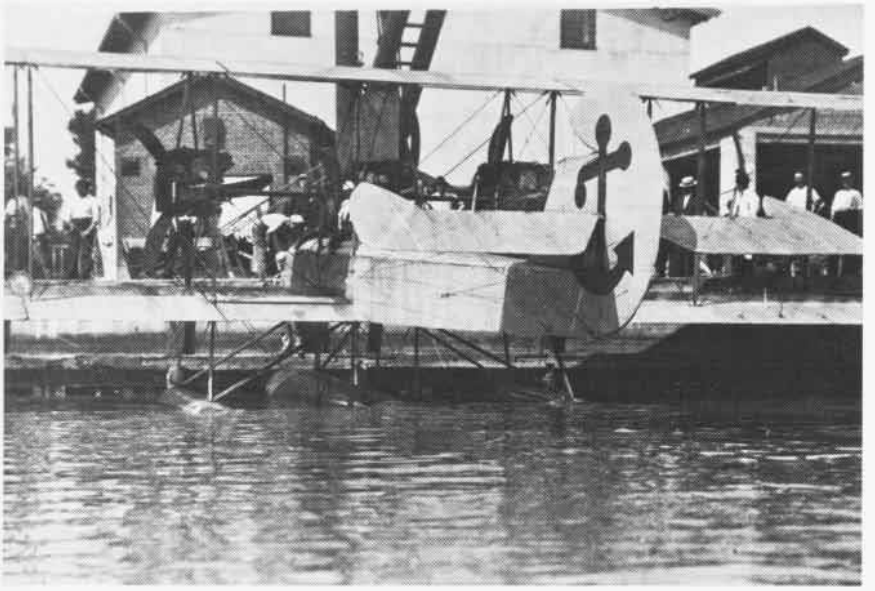
The insignia of my old squadron, VA-304, was a Firebird with a skull on a black background. It seems there was another squadron which used the Firebirds. I believe it was VF-66 which was decommissioned in late 1946 or early 1947 and was one of the last squadrons to operate the Ryan FR-1.

I am hoping someone will be able to assist me in locating its insignia.

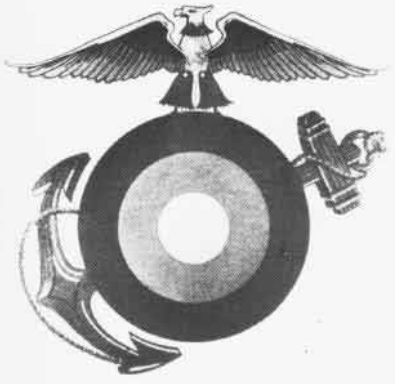
I enjoy reading *NANews* and like the change in its format that has taken place.

Robert Billington
4202 Solar Circle
Union City, Calif. 94587

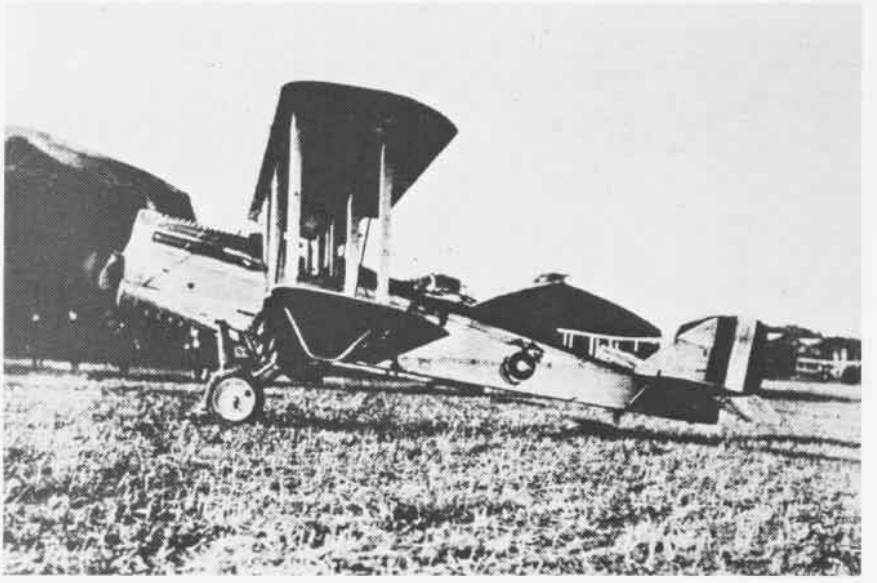
Ed's Note: The Winter 1963 issue of the *American Aviation Historical Society Journal* contains information on Mr. Billington's request, but additional data is solicited.



In 1916, an anchor was prescribed in a Bureau of Construction and Repair drawing as a disguishing mark for naval aeroplanes, the first Navy air insignia.



This insignia, the first for Marine Aviation, was designed during WW I and at that time was used only by the First Marine Aviation Force, Northern Bombing Group.



'There was never any doubt in my mind that I would effect a successful landing.'

NAVAL AVIATION
NEWS